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A
FIRST BOOK
OF
PRACTICAL PSYCHOLOGY

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BY

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LIST OF APPARATUS

Besides the things of daily use in school and home, the following articles will be necessary for performing the experiments contained in this book:—

- 1—An incandescent gas lamp or electric lamp, with a regulator.
 - 2—A board with a narrow slit in it.
 - 3—An ordinary Colour Wheel.
 - 4—Standard coloured paper discs.
 - 5—A Harmonium or a Piano.
 - 6—Two stringed instruments of different kinds—say Banjo and Violin.
 - 7—A number of strong smelling objects.
 - 8—Some sugar, quinine, lemon juice and sea water.
 - 9—All weights from $\frac{1}{8}$ th of a grain to 66 grains or more and a 4 lbs. weight.
 - 10—Some formic acid diluted 100 per cent.
 - 11—A revolving chair.
 - 12—A measuring tape.
 - 13—A stop watch.
 - 14—A Dark Room.
-

PREFACE

This book is designed to give to the beginner in Psychology a bare skeleton of the Science round which he may subsequently weave his psychological knowledge into a system. I have ventured to give a practical turn to the subject by aiming at imparting a *direct* insight into the facts of mental life instead of giving a theoretical description, as is generally done in the text-books of Psychology. The experiments and observations mentioned only lay down the lines on which teaching should proceed. The teacher will perhaps find that in many cases he can substitute experiments more suited to the particular conditions. I would advise a free use of original experiments under these circumstances.

The questions given at the end of each chapter serve a very important purpose. The teacher should help the students to finding answers to those questions. The answers will also serve as tests of the understanding of the Chapter.

My best thanks are due to my colleague, Professor K. K. Mukerji, M.A., who in the midst of his numerous occupations found time to read the manuscript before it was sent to the press and gave me much valuable advice.

Patiala,
20-7-1927.

M. S.



CHAPTER I

ATTENTION

Experiment 1.

Instructions :—Keep seated comfortably in your seat. Do not *do* anything. Do not speak. Do not try to solve any problems. Let your mind go whither it pleases. There is no harm if you go to sleep. When you are roused think of the state of your mind during this time.

The condition of the mind in which the student finds himself during this period is called **Inattention**.

Experiment 2.

Instructions :—Open page 12⁵ of this book. Read carefully and try to understand the meaning. Keep away from you if any other thoughts come and disturb you. After you have understood the contents of the page, observe the state of your mind in which you were at the time when you tried to understand them.

The condition of the mind during this time is called **Active Attention**. Suppose while you are trying to understand what you are reading, a gas reservoir in the laboratory bursts¹ and for the moment

¹ The teacher will do well to make use of a cracker, if nothing else, to demonstrate this.

you forget all about the work you are doing—thinking only of the gas explosion. The state of your mind at this time is called **Passive Attention**.

With the exception of those periods of our life when we are asleep or day-dreaming, we are always *attentive*--attending to our studies, or games, or meals, or friends' talk, or what not.

Attention is of two kinds: Active and Passive. We attend actively when we have no natural propensity to attend to an object but still want to attend to it, withdrawing our mind from those objects to which we are naturally inclined to attend. We have therefore to *make an effort* to attend actively. Attention to those things which naturally attract us is passive attention. Abrupt changes, bright lights, loud sounds, intense pains—are all attended to passively. Sometimes we make such a constant effort to attend to a thing actively that we create in us a propensity to attend to that thing whenever we are made aware of its presence. Such attention is called Secondary Passive Attention.

Experiment 3.

Instructions:—Repeat the contents of page 127 every morning for ten days. After the lapse of four days read the same passage again. Observe the state of mind in which you find yourself after you have read the first few words on the page.

This is a state of mind which the psychologists

call **Secondary Passive Attention**. In the beginning attention to the same thing was effortful attention, attention under difficulties—active attention—because there were no natural tendencies of attention. Now the attention is effortless, easy—passive—because the necessary tendencies have been formed by repetition. Attention means caring more for a certain thing than for others, while when we are inattentive we attach equal importance to all the things we engage ourselves with. When we attend to the lecture we care more for it than for the games or books or what not; when we attend to the game we care more for it than for the lecture or talk or any other thing in the world with which we may be in any way concerned. But when we are inattentive our mind is open to every thought that may come. All have an equal right to come or not to come.

Interest is the name generally given to the tendencies of attention, natural and acquired. We are said to be interested in a thing if we have a tendency to attend to that thing.

QUESTIONS

1. Give from your own experience five examples of each of the following:—
 - (1) Passive Attention.
 - (2) Secondary Passive Attention.
 - (3) Active Attention.
 - (4) Inattention.
 - (5) Interest.
2. Distinguish clearly between attention and interest.

CHAPTER II

PERCEPTION

Experiment 4.

Instructions:—See the wall, the blackboard, the chair, the table or any other object that may be present; hear the bell ringing, the rain falling, the wind blowing, the teacher speaking or any other object which may be giving out an audible sound; touch the desk, the book, the neighbour or any other solid object; feel the heat of the fire or the chilliness of the atmosphere, and the pain of a pinch or a cut; smell the gas in the laboratory or the flower in the pot outside; taste an article of food. Now examine your knowledge of the wall, blackboard, chair, table, bell, rain, wind, teacher, desk, book, neighbour, fire, atmosphere, pinch, cut, gas, flower, food, etc., etc.

Each one of these mental operations is a **Perception**. Your knowledge of the wall before you is a perception. Your knowledge of the ringing bell is a perception. Your knowledge of the desk which you are using is a perception. Your knowledge of the fire burning in the room is a perception. Your knowledge of the pinch or cut that you have got is a perception, and your knowledge of the food that you are eating is a perception.

A perception is called a **Concrete Mental Process** because it gives us a knowledge of a *concrete* object and not of *abstract* qualities. Concrete objects are such that they exist by themselves, while qualities can be found only in concrete objects. They cannot exist independently of objects. They are *abstractions*. Whiteness of the wall, sound of the bell, hardness of the desk, heat of the fire, pain of the pinch or cut, taste of food—are all abstract qualities which can be found in these or other objects, but which cannot subsist independently of any concrete objects like these. In the beginning our knowledge of things is poor. It is confined to what we actually see, or hear, or touch, or smell, or taste. But it gradually becomes richer and richer. When a child sees a wall for the first time, he only knows what he *sees*. But when a grown-up man sees a wall, he *perceives* an object before him which he knows not only to be white in colour, but also hard and made of brick and mortar. When a child first hears the sound of the bell, his knowledge is confined to the sound, but the same perception in the case of an adult means the knowledge of a bell which is either the College bell, or the Church bell, or some other bell. When a child gets a cut for the first time, he knows only the pain, but the grown-up man who gets a cut knows it to be from a knife which will make him bleed and may result into suppuration, etc.

Psychologists distinguish between these two kinds of perception by using the terms **acquaintance** and *Pure Perception* for the one and **knowledge about** and *Symbolic Perception* for the other. In the beginning children get *acquainted* with things; it is only later, when perceptions of the same things are repeated, that they begin to anticipate the presence of qualities which are not presented to sense and thus get *knowledge about* things. The poorest perceptions are called **Pure Perceptions**. The more we know *about* things the richer our perceptions grow. The richest of perceptions which are started off only by acquaintances with single attributes of things are called **Symbolic Perceptions**.

QUESTIONS

1. Give from your own experience five examples of each of the following :—
 - (1) Perception of objects.
 - (2) Perception of Locality.
 - (3) Perception of Direction.
 - (4) Perception of Distance.
 - (5) Perception of Time.
 - (6) Pure Perception.
2. Why are Perceptions called concrete mental processes?

CHAPTER III.

FEELING

Experiment 5.

Instructions:—When you are hungry take a moderate quantity of some delicious food; when you are tired * lie down on the grass; when you are feeling very hot * jump into water; or¹ when you are feeling very cold * go near a large fire. Do not take anything for a long time inspite of feeling hungry; go on vigorously with your work for a long time after you are tired; neither fan yourself nor go near water when you are feeling hot; neither put on more clothes, nor bask in the sun, nor go near fire when you are shivering from cold. Afterwards carefully observe the state of your mind at the time when you were undergoing these experiences.*

These mental processes are all **Feelings**. Although there are innumerable varieties of feeling, e.g., feelings of headache, ear-ache, stomach-ache etc., feelings of joy and sorrow and feelings of hearing

* Not otherwise.

¹ Any *one* of these experiments will suffice in the absence of other experiments.

good and bad news, etc., every feeling is either pleasant or unpleasant. Whenever a perception or another concrete mental process is either appreciably pleasant or appreciably unpleasant, it becomes a feeling. Feeling, therefore, like perception, is connected with a concrete object or concrete happening and is a **Concrete** mental process.

QUESTIONS

1. Give from your own experience five examples of each of the following :—

- (1) Feelings connected with your body.
- (2) Feelings caused by a change in your surroundings.
- (3) Feelings due to your having come to know of something which you did not know before.

2. Compare and contrast between Perceptions and Feelings.

CHAPTER IV

IMPULSE

Experiment 6.

Instructions:—Try to go near a stranger dog, a wild bull, or another animal, or an angry man. When you are feeling very hungry, go to the kitchen where dainty dishes are freshly prepared and arranged on the table; stand in the shade when the sun is shining and you are not sufficiently clad: or¹ prepare your lesson extraordinarily well and go to the class when the teacher is asking questions on that topic. Carefully observe the *tendencies to perform an action* which you may experience in any of these situations.

The tendency to *run away* when you are face to face with an angry person, stranger dog, or a wild bull; the tendency to *swallow the food* displayed on the kitchen table; the tendency to *move* to the sun; and the tendency to *stand up and repeat the lessons* are all typical **Impulses**. Whenever we perceive an object or a situation and are inclined to *act* in a certain way with reference to that

¹ Any one of these experiments will suffice in the absence of others.

object or situation, we are said to be experiencing an Impulse.

Impulses, like perceptions and feelings, are concrete mental processes, because they are aroused in connection with concrete objects or situations. In actual experience perceptions, feelings and impulses all come together. We perceive certain things, feel them in a certain way and are inclined to act towards them in a definite manner. We *see* a wild beast in the jungle, *feel* ourselves in danger and *want* to run away. Knowing, feeling and willing are, therefore, the three aspects of one and the same mental operation—the experience of the individual in a certain situation. These three aspects of mental life are technically known as Cognition, Affection and Conation.

Although these three phases are always present whenever there is any mental activity whatsoever, a particular mental state is said to be Cognitive when knowledge predominates and affection and conation are in-appreciable; it is said to be Affective when feeling predominates and cognition and conation are so feeble as to appear dormant; and it is said to be Conative when willing predominates and cognition and affection are so weak as not to deserve notice at all. When you are sitting on a cushioned sofa and doing your work, you are having a perception of the sofa—a cognitive process. When you are not doing any work but enjoying the

springed seat in a moment of leisure, you are having a feeling—an affective process. But when you are dead tired and lay yourself down on the sofa, you want the state of rest and ease to continue and are experiencing an impulse—a conative mental process.

Every concrete experience is essentially cognitive, affective, as well as conative, with one side predominant, which gives its name to the experience.

QUESTIONS

1. Give from your own experience five examples of each of the following :—

- (1) Impulses with regard to one's own self.
- (2) Impulses towards your companions and friends.
- (3) Impulses towards strangers.
- (4) Other impulses.

2. Explain by giving concrete examples that knowledge, feeling and willing come together in experience.

3. How are Cognitive, Affective and Conative mental processes distinguished from one another?



CHAPTER V

SENSATION

Experiment 7.

Instructions :—Take a very good ripe orange, look at it carefully, feel it well in your hand, and then eat it. Analyse the perception of orange that you get in all its details. You know that the orange is yellowish, it is soft, it is fragrant and that it is sweet. Your knowledge of the orange is, so to speak, made up of its yellowishness, its softness, its fragrance, and its sweetness—the perception is given to you in terms of colour, touch, smell and taste.

Each one of these items of knowledge is a **Sensation**. To experience a sensation is to be acquainted with any of the particular aspects in which an object presents itself. Yellowishness, softness, fragrance, and sweetness are the abstract qualities of the orange (which is perceived). The orange, as a whole, is *perceived*, while each one of these abstract qualities is *sensed*. Perceptions of concrete objects are *Concrete Mental Processes*. Sensations of abstract qualities of those objects are *Elementary Mental Processes*. They are so called

because they cannot be further analysed. Every perception, feeling, or impulse can be analysed by a psychologist into its constituent aspects—sensations and others.* But no elementary process can be so analysed. A sensation is a sensation and nothing more. Sweetness is sweetness and yellowness is yellowness. While we can describe an orange by mentioning its various qualities, we cannot by any possible method describe any of the simple qualities themselves. Similarly we can give a psychological account of the perception of orange by saying that it includes the cognition of sweetness, yellowishness, etc.,—the attributes of orange: but we cannot in any possible way describe the sensations of sweetness, etc., of which the perception of orange is constituted. The only means of making a man acquainted with *sweetness* is to give him a sweet object to taste and the only method of giving him an idea of *yellowness* is to show him a yellow object, and so on with every other sensation. But if a man has once experienced sweetness, yellowness, etc., you can describe to him a number of objects, which he has not perceived, in terms of these sensations. You can tell him, *e.g.*, that chocolate is sweet like an orange, but it neither possesses the yellow colour, nor the soft touch, nor again the frag-

*For the other two aspects of concrete mental processes see Chapter VI—Affection, and Chapter VII—Conation.

rance of the fruit. If a man is acquainted with the sensations of brownness, hardness, and the smell of the sweets, you can tell him that chocolate is, instead, brown in colour, harder than orange and smelling like sweets; and even if he has never seen a chocolate before, he would be able to form some idea of the object.

Concrete objects can exist by themselves, but abstract qualities have no separate and independent existence. They can be found only as aspects of concrete objects—they *inhere* in them. So it is clear that no sensations corresponding to them can be experienced without at the same time having the perceptions of the objects in which they are found. Sensations, like qualities themselves, are therefore the results of abstraction.¹ They are simpler than perceptions, but they do not come *first* in the development of mental life. We perceive objects first and then analyse our perceptions into so many sensations. Sensations are *distinct*, as mental processes, from perceptions; but they cannot be *separated from* them except in thought. You can with some effort call up to your mind the sensation of yellowness without at the same time calling up orange or another yellow object to the mind, but you cannot actually experience a yellow sensation

¹ Separation in thought.

without at the same time experiencing the perception of a yellow object. Sensing is not possible without perceiving.

One point more about sensation. Sensations do not give us *knowledge* in the strict sense of the word. Not that there is no object of sensation. Just as the concrete thing is the object perceived, the abstract quality is the object sensed. The objects of sensations are simple qualities. But sensations do not mean objects in the sense that perceptions mean objects. The very moment sensations begin to acquire meanings they become perceptions. The merest experience of yellowness is a sensation. But the cognition of the yellowness of the orange is a perception. Similarly hardness is a sensation but the awareness of the stool being hard—a *knowledge* of the hardness of the stool we are occupying—is a perception. Sensations are in a sense cognitive mental processes like perceptions. They do not, however, give us knowledge of things but a mere lived experience of qualities. They are subjective.

QUESTIONS

1. Give from your personal experience five examples of each of the following:—

- (1) Sensations from the eye.
- (2) Sensations from the ear.
- (3) Sensations from the nose.
- (4) Sensations from the mouth.
- (5) Sensations from the skin.

2. Distinguish clearly between Sensation and Perception.

CHAPTER VI

SENSATION (*continued*)

VISUAL

Observation 1.

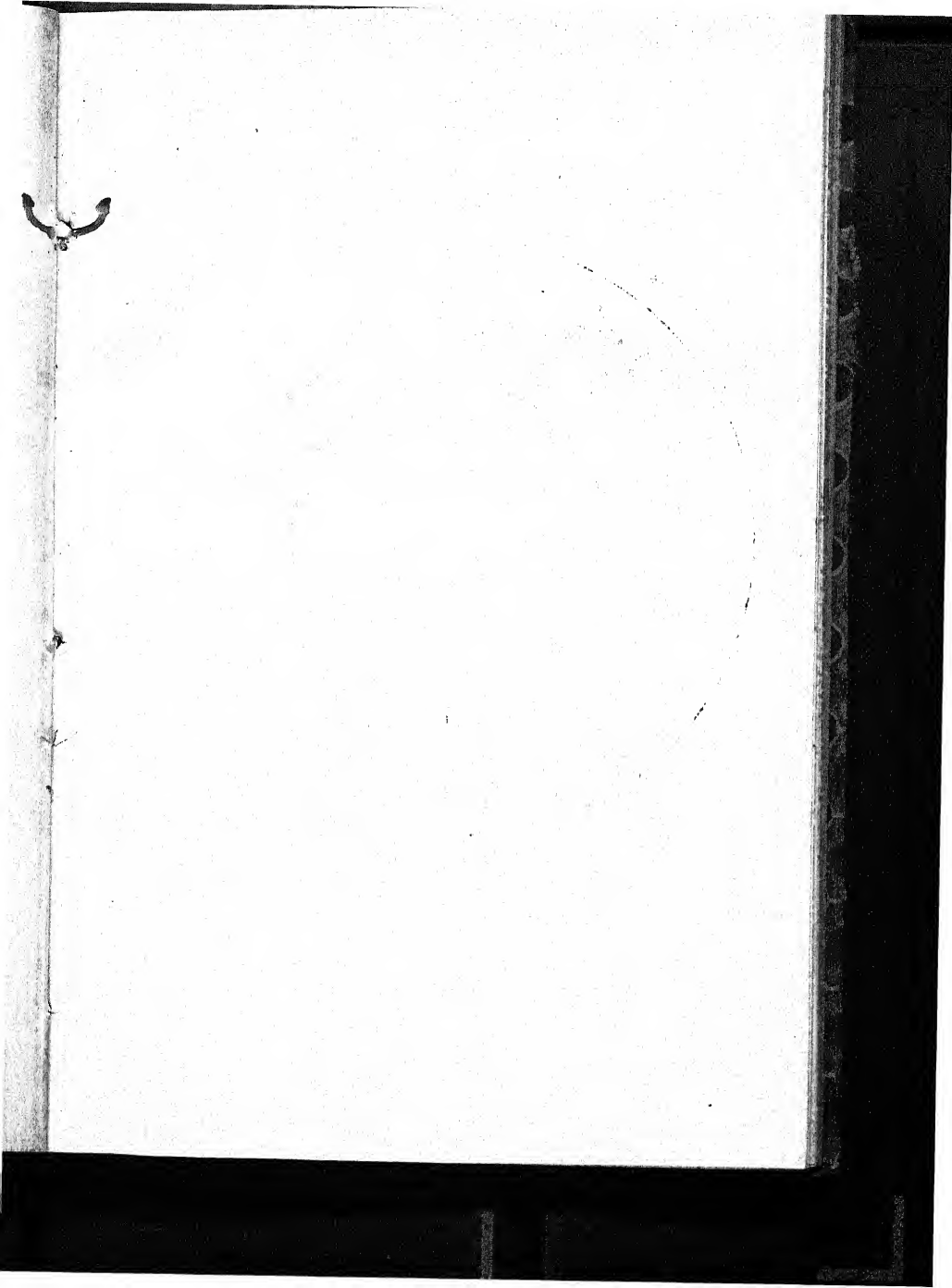
Instructions :—Carefully observe the diagram given opposite page 17 of this book. Perceive the various parts of the diagram marked 1,2 etc., analyse the perception and bring clearly to your mind those qualities of the different parts which distinguish one part from the other.¹

These distinctions are called distinctions of Brightness. All the sensations which you get when you look at the various parts are sensations of Brightness. But each differs from the other in *degree*. So there are so many shades of brightness. Where brightness is at its height, the sensation we get is called **White** (part 1).

Where the degree of brightness is nil, the sensation given is **Black** (part 11).

All the intermediate shades have less and less of whiteness in them, and are called the various shades of **Grey**.

¹ Do not consider the spatial distinctions if they occur to you.



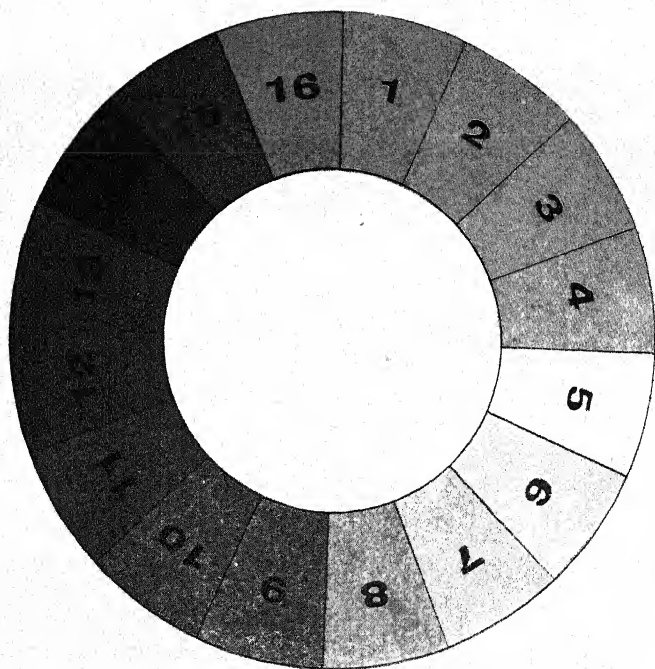


Fig. 2.

Complete absence of light gives the sensation of Blackness.



Fig 1.

As the degree of light shown by the object of perception increases, we get more and more of brightness till we reach a certain stage where the sensation given is **Neutral Grey** (part 6). If we go on increasing the degree of brightness, we ultimately get the sensation of whiteness.

Experiment 8.

Instructions :—In a pitch dark room, touch and feel a white object and try to see the object. In the absence of all light, artificial or natural, the object will appear as Black. Let light fall on that object from an incandescent gas lamp,¹ through a narrow slit. First dim the light to the extreme so that the lamp would go out if you lower it any further. Observe the sensation which now distinguishes the object of perception from the surrounding objects. This sensation is Dark Grey. Then go on illuminating the light *gradually* till you have passed through all the shades of Grey and attained the sensation of Whiteness from the object.

¹ Or an electric lamp with a regulating switch.

Observation 2.

Instructions.--Look at the coloured diagram opposite page 17; analyse your perception of the figure and observe the qualities of the various parts which distinguish one part from another.¹ The sensations which distinguish the knowledge of one part from another are called sensations of **Colour**—Colour Hues. The sensations which you get from the various parts of the figure are the following:—

¹ Do not consider the spatial distinctions if you are struck with them.



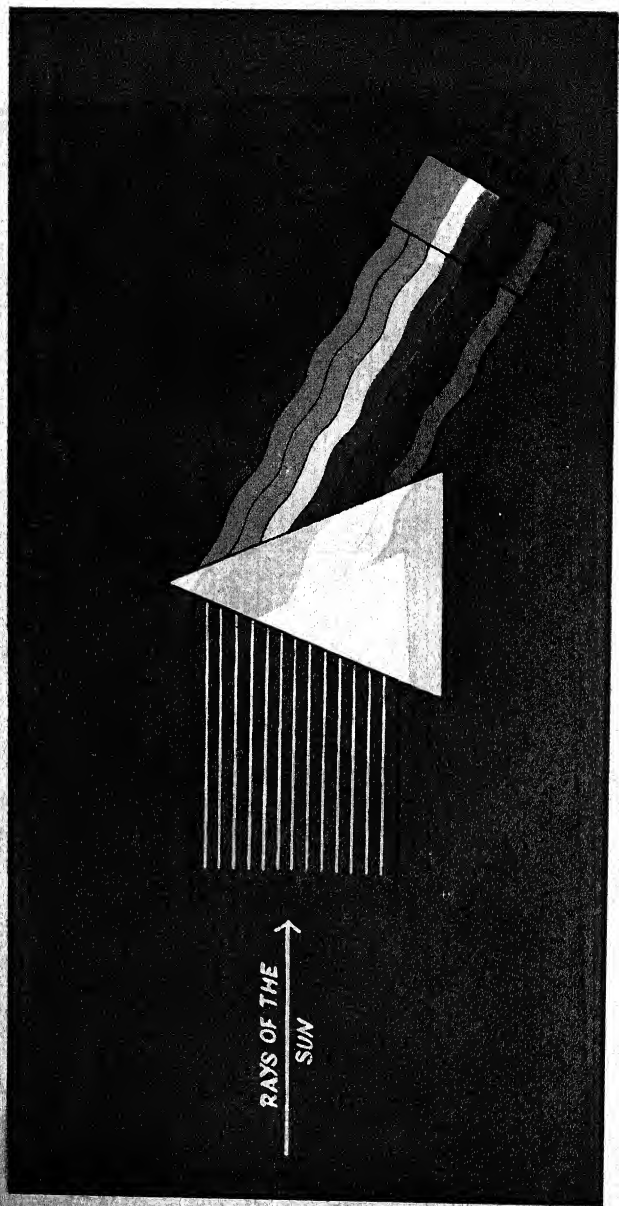


Fig. 3.

Part 1	...	... Red
" 3	...	... Orange
" 5	...	... Yellow
" 7	...	... Yellow Green
" 9	...	.. Green
" 11	...	... Blue Green
" 13	...	... Blue
" 15	...	.. Purple

You will notice that you can pass on imperceptibly from one colour to another. You cannot, *e.g.*, draw a hard and fast line where Part 1 ends and Part 2 begins, and so on with every pair of adjacent parts.

In every sensation of colour there is an admixture of some degree of brightness. Without brightness no sensation of colour is possible.

Experiment 9.

Instructions.—Look at a coloured object at night, or in a dark room in the light of an incandescent lamp. It will appear of a certain colour. Dim the light a little, and again observe the colour of the object. You will notice that the colour is not exactly the same as before. In fact the *Colour* is the same, but the degree of brightness with which the colour is mixed has been changed. Dim the light further and you will sense a new colour. Go on in this way till the lamp is practically out. Observe the object now, and you will see it

only as a kind of grey. Shut out light altogether from the object, and you will now see it as black.

The presence of any degree of colourless light gives us the sensation of brightness. Absence of all light gives the sensation of blackness. The brightest light gives the sensation of whiteness. We get sensations of colour when pure white sunlight is decomposed by passing through a prism; when white light passes through a coloured transparent substance, like glass, or when it falls on an object which is already *naturally coloured*.¹

Every colour can therefore have a number of brighter and duller tints. We can have, *e.g.*, a very light red, a number of medium tints of red, and a very dark red.

Experiment 10.

Take a triangular prism. Put it in the sun so that the rays of the sun may fall directly on the flat surface of the prism as shown in the diagram opposite page 19. Notice the result.

¹ Objects are naturally coloured when they have absorbed certain coloured rays from the sun.



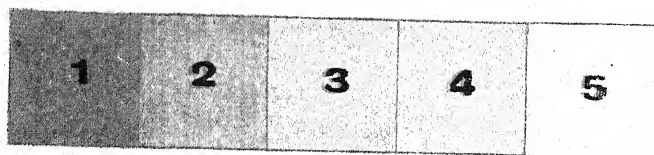


Fig. 4.

You will observe that the pure white light of the sun has resolved itself into a band of seven colours, called the Solar Spectrum. All the colours of the spectrum are not of equal degree of brightness. Yellow is the brightest colour of the spectrum. Blue is the darkest. Green is brighter than Red but they are both intermediate in degree of brightness between Yellow and Blue.

Observation 3.

Instructions :—Perceive the coloured diagram given below, observing carefully the various parts marked 1, 2, 3, etc. The colour quality in which each part differs from the other is called **Saturation**. Brightness becomes coloured when it is mixed with any of the 'true colours'. But the mixture may have more of colour or more of the particular degree of brightness with which it is mixed. The more of 'true colour' there is in any sensation of colour, as compared to brightness, the more *saturated* it will be. The redder a red is, as for example, the more redness,



it has —the more saturated it is, and so on with all the colour hues.

Experiment 11.

Instructions :—Take a colour wheel. Have two discs of the same size differing in colour and capable of adjustment to the plate. Place the two discs together on the plate so that only half of each disc shows. Turn the wheel rapidly and note the resultant sensation of colour.

Compare the sensation thus obtained from the two colours of the discs. You will find that it is a new colour, different from both of them. This is the result of the **Mixture** of the two colours. Any two colours can be mixed in this way in any proportion and a new one produced *in each case*. One half of each disc is made visible in experiment 11. You can similarly show one third of one disc and two thirds of the other, or one fourth of the one and three fourths of the other, and so on. In each case you will get a new colour as the result of mixture.

Experiment 12.

Instructions :—Mix on the colour wheel Carmine and Bluish green, Yellow and Blue, Yellowish-green and Violet, Green and Purple, and note the resultant sensation of colour.

You will find that if any one of these pairs of colours is mixed, the resultant sensation will not

be of a colour of any degree of saturation but a sensation of brightness—white, black, or a lighter or darker shade of grey. Any two colours which result in the loss of saturation when mixed, that is, which become 'brightness' when they are sensed at the same time and at the same place, are called **Complimentary Colours**. Each colour is said to be the complimentary of the other. Red is the complimentary of Verdigris, as for example, and Yellow of Blue.

Experiment 13.

According to the instructions of experiment 11 mix Red and Yellow and you will get Orange.

Mix Yellow and Green and you will get Yellow Green.

Mix Green and Blue and you will get Blue Green.

Mix Blue and Red in the ratio of 1 : 3 and you will get Violet.

Mix them in the ratio of 1 : 1 and you will get Purple.

Mix them in the ratio of 3 : 1 and you will get Carmine.

Mix Purple and Blue and you will get Violet.

Mix Green and Violet and you will get Blue.

Experiment 14.

Instructions :—Mix all the seven colours of the Solar Spectrum and you will get an unsaturated sensation of light—a sensation of brightness—white or grey.

Sensations of Colour and Brightness are called Visual Sensations—sensations of sight. They are also known as 'sensations from the eye', because they are connected with that sense-organ. Whenever we get a sensation of brightness or colour, they say that there is an excitation of that part of the brain—the Visual Centre—which is connected with the eye by means of the optic nerve. The part of the eye where the visual cells are found—the true sense-organ for sight—is the black wall behind the eye which cannot be seen. It is called the Retina.¹

QUESTIONS AND EXERCISES

1. Give from your own experience as many examples of each of the following as you can:

- (1) Brightness.
- (2) Hues.
- (3) Various tints.
- (4) Different degrees of saturation of the same colour.

2. Carefully examine the Solar Spectrum and note all the various shades of Colour that you can discern.

3. Try all kinds of colour mixture and say whether you can discover any sets of three or four colours, combining which you can produce all the possible sensations of Colour.

¹ See the Physiological Charts of the Eye and the Brain.

CHAPTER VII

SENSATION (*continued*)

AUDITORY

Experiment 15.

Instructions :—Throw a heavy book from the height of a foot or so, so that it may fall flat on the floor ; tap the desk or the table with your fist ; slam the door ; or beat the floor with your foot. Analyse your knowledge of each of the situations experienced by you and notice that one gives you a *thud*, the other is a *bang*, the third is a *boom*, and the fourth is a *tap*. These distinctions are known as the distinctions of **Noise**.

Experiment 16.

Instructions :—Take a book with a ribbed cloth binding. Tap the cover with a finger nail. This will give you a Noise. Now draw the nail across the ribs over a span of about an inch, from left to right and back, first at the speed of twice in a second, then four times, then eight times in a second, and so on. This will give you so many different sensations of **Tones**. The more quickly your finger moves the higher will be the tone.



Observation 4.

Instructions :—Press C of the First Octave of a Piano or Harmonium, then press D minor, then D major, then E minor, then E major, and so on. That which distinguishes one sensation from another, here, is the difference of **Tone**. E major is a higher tone than E minor. E minor is a higher tone than D major. D major is a higher tone than D minor, and so on.

All the sensations of noise and tone are called Auditory Sensations—Sensations of Sound. Whenever there is a sensation of sound, they say, that part of the brain is excited which is connected with the ear by means of the Auditory Nerve¹. Hence the sensations of sound are known as sensations from the Ear. The sense-organ for sensations of sound, the seat of the sound cells, is a bony cavity of the shape of a conch-shell and is known as the Cochlea.¹

Just as we cannot have a sensation of colour without at the same time having a sensation of brightness, in the same way we cannot have a sensation of tone without at the same time hearing some noise or the other. Every tone is *grounded* on some noise. The same tone can, however, be grounded on different noises, as you experience when you hear the same note being sounded by several different

¹ See the Physiological Chart of the Ear and the Brain.

musical instruments. And similarly a large variety of tones can be grounded on the same noise as you get when you hear a tune being played on a musical instrument. A tune is a series of notes succeeding in an order. Every man who sings and every musical instrument has got his or its own peculiar quality of noise. Each man's noise is different from the other, though they may sing the same tune in chorus. The noise made by the organ is different from that made by the violin and they are both different from that given out by the clarionet, though the same tune might be played upon and the same notes sounded from each instrument at the same time in an orchestra.

Experiment 17.

Instructions:—Take the cap of a bicycle bell, or another sweet-sounding object, or a stringed musical instrument. Clink the object, or a high tuned wire, and carefully observe the tone which you hear. After the first tone is heard you will hear a reverberation of higher and higher tones. These high tones, which are given out after the first tone, are called **Overtones**, the principal tone being called the **Fundamental Tone**.

Observation 5.

Instructions :—Take two musical instruments which produce the same sound so far as the noise quality goes, but one of which is well tuned, while the

other is not. Sound the same note on both and mark the difference between the two sounds. The one is rich in overtones, the other is poor. This distinction in the sensations of sound is known as the distinction of **Timbre**.

QUESTIONS

1. Give from your personal experience as many examples of the following as you can :—

- (1) Different kinds of noise.
- (2) Higher and lower pitches of tone.
- (3) Sounds of different Timbre.

2. Distinguish clearly between noise and Tone.

CHAPTER VIII

SENSATION (*continued*)

CUTANEOUS

Experiment 18.

Instructions :—Take a coin, about one inch in diameter, and place it in quick succession on the various parts of your body—head, forehead, neck, cheeks, chest, back, arms, hands, leg, feet, etc. That in which your knowledge of the coin placed at one spot is like the knowledge of the coin placed on another spot is the sensation quality. At every place you get a set of sensations of pressure from the coin¹.

Experiment 19.

Instructions :—Take two big keys out of your bunch. Place one of them for fifteen minutes, and the other, for half an hour in the sun or near a fire kept burning uniformly. Apply the two keys at the same spot on your body one after the other. The difference between your knowledge of the two keys is given to you by the two different sensations of **Heat**.

¹To get a single indivisible sensation of pressure apply single hairs on the pressure spots (See page 31.)

Experiment 20.

Instructions:—Take three tumblers full of water. In one place two ounces, and in the other one ounce, of well crushed ice. Let the third remain as it is. Dip your finger (the same finger) in each of them one after the other. That in which your knowledge of the contents of one glass, as given by the finger, differs from your knowledge of the contents of the other glass is the sensation of **Cold**. Sensations of Heat and Cold are called Temperature Sensations.

Experiment 21.

Instructions:—Press the pencil point on your skin *with some force*. Go on pressing it more and more forcibly till it becomes unbearable. The difference in your knowledge of the pencil point at the successive moments—that which goes on increasing as the pencil is pressed with greater and greater force and decreasing as the force is gradually relaxed—is called the sensation of **Pain**. Whenever you are cut, pinched, or squeezed you get a sensation of pain.

The sense organs for Pressure, Temperature and Pain—the pressure, pain and temperature cells—are found embedded in the skin. Hence Heat, Cold, Pain and Pressure sensations are called Cutaneous Sensations. Sensory nerves run from every part of the skin to the cutaneous brain centres. It is not every point on the skin which

gives us all the cutaneous sensations. At some points we get one kind of them, at another another. There are Pressure spots, Heat spots, Cold spots and Pain spots on the skin. But every point on the skin would probably produce a pain sensation, if the stimulus is sufficiently intense

QUESTIONS AND EXERCISES

1. Give from your own experience five examples of each of the following:—

- | | | |
|----------------|----|-----------|
| (1) Sensations | of | Pressure. |
| (2) " | " | Heat. |
| (3) " | " | Cold. |
| (4) " | " | Pain. |

2. Explore the skin for 'pressure spots' by means of a fine hair mounted on a wooden handle; for 'heat spots' by means of a blunt point maintained at a temperature of 45° centi. = 111° F; for 'cold spots' by means of a cold blunt pointed rod; and 'pain spots' by means of hairs which exert considerable pressure on the skin.

3. Demonstrate by means of an experiment at what point heat and cold sensations are transformed into pain sensations.



CHAPTER IX

SENSATIONS (*continued*)

OLFACTORY AND GUSTATORY

Experiment 22.

Instructions:—Close your eyes and bring near your nose a fruit blossom, a fresh fruit, a rose, different kinds of scented objects, different varieties of spice, etc. That in which your knowledge of each one of these substances differs from the other is the sensation of **Smell**, or Olfactory Sensations. Every fruit has its own smell and the smell of fruits is different from the smell of pickles, spices or flowers. The smell cells are situated on a patch of mucous membrane lining the upper part of the nose. The Olfactory Nerve connects the olfactory cells of the nose with the Olfactory Centre of the brain.

Experiment 23.

Instructions:—Place a quantity of sugar, and then a little of quinine, on the tongue; drink a little of pure lemon juice, and then a mouthful of sea water or brackish water. The sensations which give you a clue to the distinction of one object from the other are the sensations of **Taste** or Gustatory Sensations.

The sensation of taste given to you by sugar is **Sweet**, that given to you by lemon juice is **Sour**, that given to you by sea water is **Salt**, and that given to you by quinine is **Bitter**.

The taste cells are of the shape of a bottle and are situated under the small pores, or papillae, of the tongue. They are connected with the Taste Cells of the brain by means of the gustatory nerve. A soluble substance must dissolve in the saliva and percolate through the pores in order to give a sensation of taste.

One great difficulty in the way of observing gustatory sensations is the confusion ordinarily made between 'perception of taste' and 'sensation of taste'. When you eat sweets, you get a taste of them,—a perception, of which sweetness is only an inseparable but distinguishable element. The sweetness of the sweetmeat is a sensation of taste. The *entire* taste of the edible substance is the perception of taste. The perception of fresh sweets is not the same as the perception of stale sweets, although the sensation of sweetness is the same in the two cases. It is the sensations of smell and touch in the mouth which makes all the difference. Perception of taste should therefore be carefully distinguished from sensation of taste.

QUESTIONS AND EXERCISES

1. Give from your personal experience five examples of each of the following :-

- (1) Different perceptions of Taste.
- (2) Sensation of Sweetness.
- (3) Sensation of Salt.
- (4) Sensation of Sour.
- (5) Sensation of Bitter.
- (6) Different sensations of Smell.

2. Carefully observe the smells of all sorts of substances and try to classify them.

3. Can you in practice find any *sensations* of taste other than sweet, salt, sour, and bitter? If so, which?

CHAPTER X
SENSATION (*continued*)
ORGANIC

Experiment 24.

Instructions:--Do not drink anything, even when you feel like drinking, as long as you can bear it. The sensation which you will feel and which will vanish as soon as you take a sufficient quantity of cold drink is called the sensation of Thirst.

The sense organ for thirst is supposed to be the Gullet¹. The thirst cells are excited when the mucous membrane lining the upper part of the throat is dried up.

Experiment 25.

Instructions:--Do not eat anything after having fasted for a day and examine the sensation which is prominent in your mind then. After having observed the sensation carefully eat wholesome food. Again examine the state of your mind. The sensation which was present when the stomach was empty and which vanished as soon as food was had is called the sensation of **Hunger**.

¹See fig. 5 opposite page 38.

The sense organ for hunger is, like that for thirst, the mucous membrane lining the stomach¹. The membrane is shrivelled up and dry when there is no food in the stomach and gives rise to the sensation of Hunger.

Experiment 26.

Instructions :—Early in the morning before you have eaten anything, wash your finger well with soap and introduce it in your throat as far as you can bear. The sensation which you will experience by doing so is called the sensation of **Nausea**.

The sense organ for nausea is supposed to be that part of the alimentary canal which is called the Oesophagus¹.

Experiment 27.

Instructions :—Take a 4 lbs. weight, hold it in your hand, and keep the latter at the level of the chest with the arms stretched. After some time you will begin to feel a sensation at the elbow joint. This is the sensation of **Strain**.

The sense organs for strain are the string-like endings¹ of the muscles which are called *Tendons*.

¹See fig. 5 opposite page 38.

Experiment 28.

Instructions :—Take a little very dilute formic acid, apply it to your skin and carefully observe the sensation which you experience. This is the sensation known as **Itching**.

The Itch cells are supposed to live in the blood. Blood vessels are therefore the sense organs for Itching.

Experiment 29.

Instructions :—Close all the doors and windows of your room and let fire burn in a blind hearth. After a few minutes carefully observe the peculiar sensation which you are having. Then open the sky lights and observe the sensation. Now throw open all the doors and windows and breathe in draughts of fresh air. Examine the sensations you experience in doing so. The difference between these three kinds of sensations is the difference of **Stiffness** or **Refreshingness**. These sensations are given by the lungs¹. Hence we feel a kind of stiffness when we are suffering from Dyspnoea, which is a lung disease, and feel refreshed when we breathe plenty of sea breeze or hill breeze through our lungs.

Experiment 30.

Instructions :—Sit in a revolving chair and turn round and round quickly. Then stop and when

¹See fig. 5 opposite page 38.

you recover your senses carefully examine the sensation which you experienced as a consequence of being revolved quickly. This sensation is called the Sensation of **Dizziness**.

Dizziness is supposed to be given by the three bony cavities which are situated near the Cochlea and are known as the Semi-Circular Canals ¹.

The Gullet, the Oesophagus, the Stomach, the Tendons, the Blood Vessels, the Lungs, and the Semi-circular Canals are all connected with the brain by means of sensory nerves. Hence some part or the other of the brain is excited whenever the sense cells situated at these places are excited in the appropriate method. The method of the excitation of each kind of sense cell is its own. The eye is excited by ether waves touching the retina, the ear by sound waves striking the drum membrane and then being transmitted to the cochlea, the nose is excited by extremely fine particles of matter coming in contact with the mucous membrane, and so on. The appropriate method of the excitation of a sense organ is called the Adequate Stimulus for that organ.

The adequate stimulus for a heat spot is a hot object touching it.

The adequate stimulus for a cold spot is a cold object touching it.

The adequate stimulus for a pain spot is any

¹See fig. 5 opposite page 38.

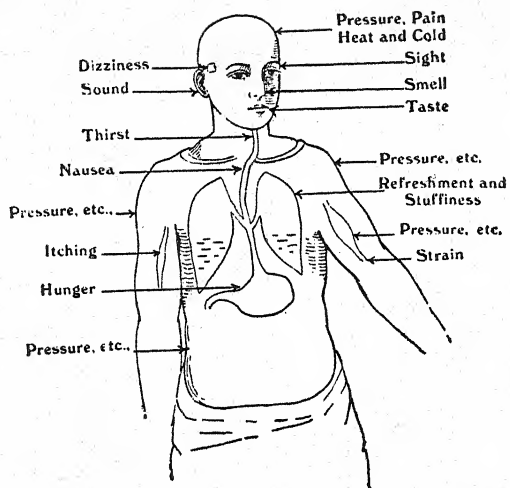
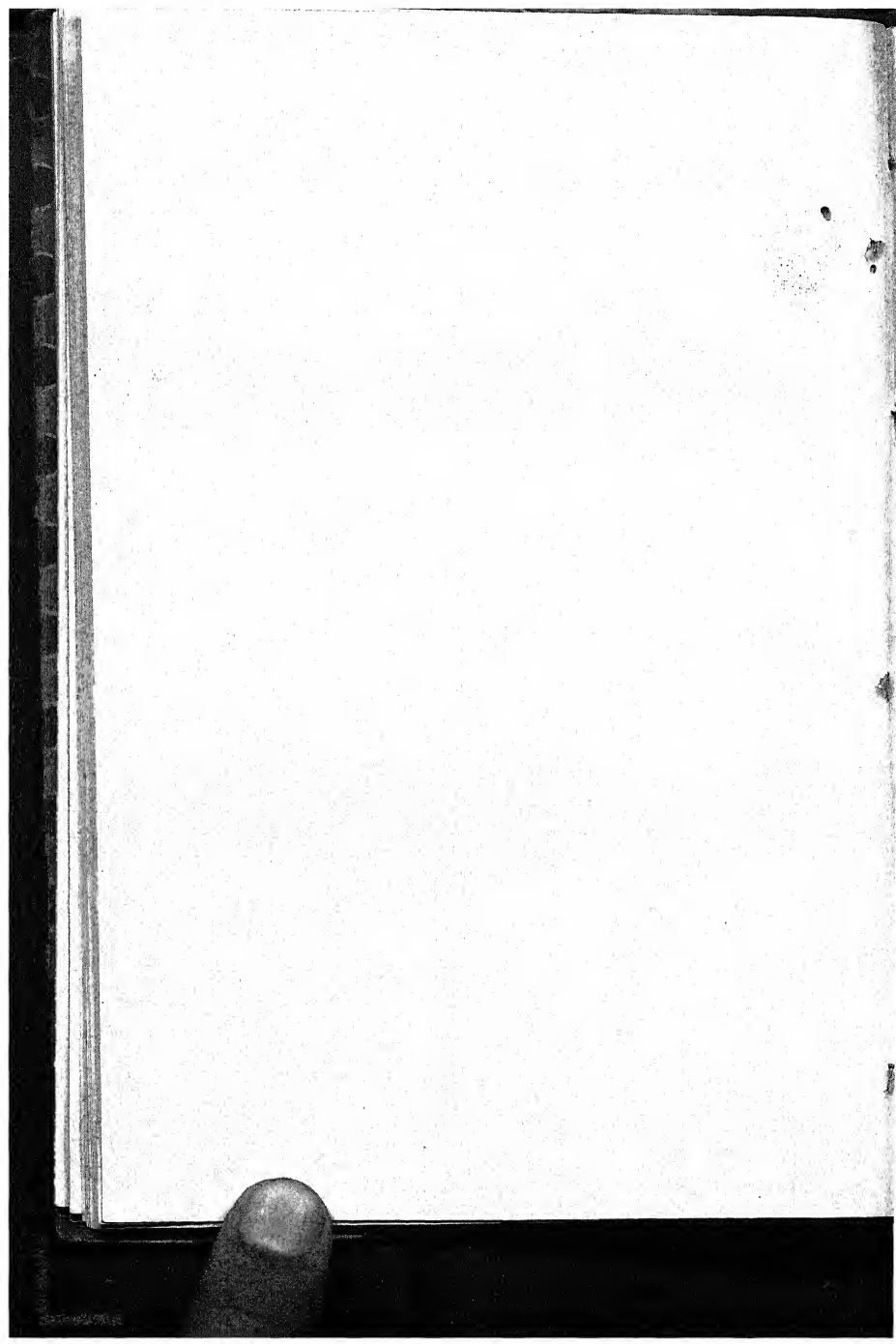


Fig. 5.





object pressing upon it in extreme.

The adequate stimulus for a pressure spot is the contact of any object whatsoever.

The adequate stimulus for taste buds is a chemical solution in the saliva.

The adequate stimulus for the Gullet is its extreme dryness.

The adequate stimulus for the Oesophagus is its Mechanical Reaction.

The adequate stimulus for the Stomach are Wrinkles on its wall.

The adequate stimulus for the Tendons is Physical Strain.

The adequate stimulus for the Blood Vessels is their Chemical Reaction.

The adequate stimulus for the Semi-Circular Canals is Loss of Equilibrium in the body.

Any change in the surroundings which excites the sense cells of any of the various sense organs is called *Stimulus*; and stimulation is another name for the excitation of sense cells. Whenever a sense cell is excited, the commotion is carried to the brain by means of some one or the other of the numerous cord-like structures known as the Afferent or Sensory Nerves. These are the wires which connect each part of the body with the brain. It is still shrouded in mystery by what process, consequent upon the excitation of the brain, is accompanied perception, feeling or impulse. It acts like magic.

Just as the physiological condition of sensation consists in the passage of a current from a sense organ to the brain, the nervous counterpart of conation is the transmission of a current back from the brain to any of the numerous muscles and glands. This is effected through the agency of cord-like structures which are known as Efferent or Motor Nerves. The bodily movement into which any activity of the muscles or glands results through the impulse of the motor nerves is called **Response**.

The physiological structure, including the brain which often enables a stimulus to elicit a response, is the **Nervous System**.

QUESTIONS AND EXERCISES

1. Give from your experience five examples of each of the following :—

- (1) Sensation of Itching.
- (2) Sensation of Stiffness.
- (3) Sensation of Refreshingness.
- (4) Sensation of Dizziness.

2. Can you find out by observation any other kinds of sensations than those given in this book? If so, which?

3. How do organic sensations differ from other sensations?

CHAPTER XI

SENSATION (*continued*)

ATTRIBUTES

So far we have studied only the qualities of sensations. Every new sensation that we have observed is a quality of sensation. Every degree of brightness and every tint and hue of colour is a distinct quality. So is every pitch of tone and every kind of noise. Pain is a quality of sensation, pressure is a quality, heat is a quality, cold is a quality. Similarly are every distinct smell; sweet, sour, salt, bitter; hunger, thirst, nausea; itching, tingling, pins and needles, strain; dizziness, refreshingness and stuffiness; all *distinct* sensation qualities. It is the **Quality** of sensation that distinguishes one variety of sensation from another. Whenever we speak of such and such a sensation we mean such and such a *quality of sensation*.

But besides quality, sensations possess other attributes also. The same quality of sensation may be experienced in different intensities, and the same quality and intensity of sensation may have more or less of extensity and may last for a shorter or longer duration.

Experiment 31.

Instructions :—Sound a certain note on the piano without the loud pedal on. Then sound the same note

with the loud pedal on. The difference between the two sounds is a difference of **Intensity**. Difference between the knowledge of two hot or cold substances of which one is hotter than the other or one colder than the other, as the case may be, as given by the skin, is a difference in the Intensity of the thermal sensations. *More or less* of the same quality of sensation is, in one word, the intensity of that sensation. Any sensation quality can be given in varying intensities.

The case of the sensations of sight is, however very peculiar. There is no absolute intensity of a visual sensation. More or less of brightness will give different sensation qualities. Pure white, e.g., which is brighter than the neutral grey is a different *quality* of sensation, as compared to the greys ; and black, which is duller than that, is also a different quality. But if there are two colours having the same tint but different degrees of saturation, then the less saturated of them has more of the particular brightness quality and less of the particular colour quality, while the more saturated has less of the particular quality of brightness and more of particular kind of colour. Thus, relatively to each other, the intensity of brightness increases as the intensity of colour decreases, and *vice versa*, the intensity of colour increases as the intensity of brightness decreases. The more saturated a colour the less of brightness it has.

It follows, therefore, that unsaturated sensations of sight *i.e.*, the sensations of brightness, do not possess any intensity at all. But the complex visual sensations, *i.e.*, the sensations of colour, which are a mixture of the sensations of pure colour and brightness, have more or less of the intensity of colour according as they have less or more of the intensity of brightness mixed with them. *Vice versa*, they have more or less of the intensity of brightness according as they are less or more saturated.¹ Of course there are no sensations of colour with no admixture of brightness whatsoever.

Besides quality and intensity every sensation possesses the attribute of *Duration*.

Experiment 32.

Instructions:—Look at the blackboard for half a second, then for one second, then for two seconds, then for three seconds, and so on up to the maximum length of time you can. Hear a whistle blowing *continuously* for half a second, then for one second, then for two seconds, and so on. That in which the several sensations of blackness, given by the blackboard one after another, differ from each other and that in which successive sensations of sound, given by the whistle, differ from one another is **Duration** of sensations.

¹ *i.e.*, have less or more of colour (see Observation 3, page 21.)

Every sensation must be experienced for a shorter or longer time. Experience is not anything material and does not therefore exist in space, but it does exist in time, and longer or shorter the duration of time for which a certain experience lasts, the longer or shorter is the *duration* of the constituent sensations. No sensation can be experienced which does not run its course in time, which is not given either for ten seconds or for five seconds, or for two seconds, or for one second, or half a second, or one hundredth part of a second, or for a lesser duration. Every sensation must have *some* duration, whatever it may be.

Quality, Intensity and Duration are not the only attributes of sensation. Some sensations possess a fourth attribute known as **Extensity**; at least the sensations of sight and touch do.

Observation 6.

Instructions:—Look at a dot on your note-book, the button of your shirt, the button of your coat, the dial of your watch, the palm of your hand, the surface of your book, the upper side of your desk, the blackboard, the wall, the sky. That in which, apart from the quality, intensity and duration of the sensations, the knowledge of the objects differs is called Extensity.

The sight of the sky is larger in *extensity* than that of the wall, that of the wall is larger in *extensity* than that of the black-board, that of the blackboard is larger in *extensity* than that of

the desk, and that of the desk is larger in *extensity* than those of the book, the palm, the watch, the button, or the dot.

Sensations exist in time but not in space. So sensations are not extended as objects in the outside world are. The extensity of a sensation is a thing altogether different from the extent, or spreaded-outness, of the objects. The visual sensation of the wall is not spread out in the same sense in which the wall itself is extended in space. *Extensity*, therefore, should be clearly distinguished from *Extent*.

While every material object that exists must be spread out in space, whether it occupies a larger or a smaller space, it is not every sensation that possesses the attribute of extensity. Sounds, as for example, have no extensity. From the intensity of a sound and your previous knowledge of the object making the sound you can infer the distance of the object from your ear. But sound, and sound alone, of any object does not give you any knowledge about the spatial relations of the object of sound.—as to whether it is large or small, near or distant, this side or that, in this position or the other, moving or stationary, etc. In knowledge of this kind it is the extensity of sensations which predominates, while sounds possess no extensity.

The knowledge, of concrete objects, in which

extensity of the constituent sensations predominates is called **Perception of Space**. Similarly any knowledge of concrete objects in which *duration* of the constituent sensations predominates is called the **Perception of Time**; and any such knowledge in which only the *quality and intensity* of the sensations predominate is called **Perception of Quality**.

Our knowledge of 'less than a second', of 'so many seconds', of 'so many minutes', of 'so many hours', of 'so many days, months, years, or centuries' is all made up of temporal perceptions—perception in which durations of sensations predominate. Temporal perceptions do not give us a knowledge of objects as such, but of their *relations* to other objects *in time*. Similarly spatial perceptions give us a knowledge of the *relations in space*—spatial relations. Most of the perceptions of space tell us how the object of perception is spatially related to us, just as most of the perceptions of time tell us how the object is temporally related with the *present*.

The qualitative perceptions tell us what the *nature* of the objects of perception is—not how the object is related to us or to other objects, but how the object can be distinguished as an object, which is neither ourself nor any other object. The qualitative perception of an object tells us what the object in itself is.

QUESTIONS AND EXERCISES

1. Give from your personal experience as many examples of each of the following as you can :—

- (i) Qualities of sensation.
- (ii) Different intensities of the same sensation.
- (iii) Different durations of the same quality and intensity of sensation.
- (iv) Different extensities of sensations having the same quality, intensity and duration.

2. Try to find out by experiments whether you can discuss differences of extensity in sensations other than those of Sight and Touch.

CHAPTER XII

SENSATION (*Continued*)

KNOWLEDGE OF GRADUAL CHANGE

Experiment 33.

Instructions:—Take the following weights:— $\frac{1}{4}$ grain, $\frac{1}{2}$ grain, 1 grain, $1\frac{1}{4}$ grains, $1\frac{1}{2}$ grains, $1\frac{3}{4}$ grains, 2 grains, $2\frac{1}{2}$ grains, 3 grains, $3\frac{1}{2}$ grains, 4 grains, $4\frac{1}{2}$ grains, 5 grains, $5\frac{1}{2}$ grains, 6 grains, and all the heavier weights which an apothecary uses up to 1 lb.. Also take small grains of rice or other corn, each such grain weighing about $\frac{1}{8}$ th of a grain. Let an intelligent friend of yours close his eyes (better tie a handkerchief round his eyes so that he cannot see anything). Without telling him what you are doing, place a grain of corn on his palm and ask him whether he perceives anything on his palm. Remove the grain and then ask him whether he feels any change in the perception of the weight on his palm. In the beginning no change will be perceived. Go on gradually increasing the number of grains until he perceives the weight distinctly—though he may not be able to say what weight he has on his palm. Weigh the grains. This will give you your friend's **threshold of pressure on the palm.**

Try the same experiment on yourself, and you will get your own **threshold of pressure on the palm.**

If you repeat the experiment, this time starting, say with a 16 grain weight, you will find that the addition of a grain or two of corn will not make any appreciable change in the sensation of pressure which your friend is experiencing. The first change in pressure that he will feel will probably come when you add corn equal to $1/2$ grain in weight. If you repeat the experiment on your friend again, this time beginning with a 32 grain weight, and going on adding $1/2$ of a grain each time instead of single grains of corn you will find that no appreciable change will be felt on the addition of the first $1/2$ grain, but that on the addition of the second $1/2$ grain the difference between the sensation given at that time and the sensation given by 32 grains will be the same as the difference felt by him, in the previous trial, between the pressure of 16 grains and the pressure of $16\frac{1}{2}$ grains. If you repeat the experiment, now starting with 48 grains, you will find that the same increase in pressure will be experienced by an addition of a weight not lighter than 3 grains. *The same difference* will be felt if you compare the pressure of 32 grains with 33 grains, and of 64 grains with 66 grains, although *the arithmetic difference* between the weights which are the stimuli for the sensations of pressure is *not the same*, being 1 grain at one time, and

2 grains at the other.¹

Experiment 34.

Draw a circle, 4 millimeters in diameter, on a white paper. Paste the paper on the wall parallel to your eye. Stand at a distance of about twenty feet from your eye, where the circle appears to you only a dot. Come gradually nearer and nearer to the wall. At a distance of about 16 feet from the wall you will see the circle as a circle, about one millimeter in diameter. Come nearer still. If you just saw the circle at a distance of about 16 feet, then at a distance of about 8 feet from the wall the circle will appear to you about 2 millimeters in diameter, and at a distance of about 4 feet it will seem to be about 3 millimeters in diameter. It will be when the distance between you and the wall is reduced to about 2 feet that you will see the circle of the size that it is, viz., about 4 millimeters in diameter. Note that while the size of the circle, as perceived by you, increases approximately in what they call Arithmetical Progression : 1, 2, 3, 4, the distance decreases approximately in an order known as Geometrical Progression : 16, 8, 4, 2.

Experiment 35.

Instructions :—Strike the table with your finger,

¹ Try all these experiments first, on your friend and then on yourself. The threshold of pressure and the minimum difference may not be the same in the two cases.

the interval between each stroke being two seconds. Ask your friend to watch the rhythm carefully. Then reduce the interval to a second and after he has carefully listened to this rhythm ask your friend to give the relation between the two. If your friend is an intelligent man, he will tell you, the strokes in the second series are doubly as quick as in the first. Then reduce the interval to half a second. Your friend will judge the strokes of this third rhythm to be as quicker than the strokes of the second rhythm as those of the second rhythm were quicker than those of the first rhythm. Now reduce the interval to one fourth of a second and the strokes will be heard as quicker than the strokes of the third series as those of the third rhythm appeared to be quicker than those of the second rhythm.

While the actual intervals in the strokes vary as 2, 1, $\frac{1}{2}$, and $\frac{1}{4}$, each difference being half of the previous one, the amount of change in the durations of the sensations given by the intervals, remains each time the same.

Experiment 36.

Instructions:—Take a Colour Top. Mix green with yellow¹ in the ratios of 17 : 1, 11 : 1, 8 : 1, 5 : 1, 3 : 1, 2 : 1, 1 : 1. Observe carefully where the first tinge of yellow appears. That would be your threshold of yellow from the side of green. Now go on raising

A you did in Experiment 14.

the proportion of green gradually in the same way and you will notice that the proportion of change in the quality of the sensation of colour does not keep pace with the rise in the proportion of the colour quality.

Gradual change of *the same kind in stimuli* sometimes gives rise to a gradual change in the intensity of sensation, sometimes in the extensity, at others in the duration and at still others in the sensation quality itself. From the last four experiments it has been made clear that if the stimuli change in a certain order, the change in the corresponding attributes of the resulting sensation does not appear in the same order. For some time a certain change in the quality, intensity, duration or extent of the stimulus does not give rise to any change whatsoever in the corresponding sensation; and then equal differences in the attributes of sensation do not correspond to equal changes in the attributes of the stimulus. Roughly speaking, an arithmetical series on the side of sensation corresponds to a geometrical series on the side of the stimulus.

If the student is acquainted with music, he will find the best example of this law in the rise of pitch at each successive note. D is as much higher than C as E is higher than D. But the differences between the number of air vibrations, which give rise to the three notes, are not equal. If the note C, as in the central octave of the musical scale, is given rise to by 480 vibrations in a second, D is the result of 540 and E of 607.5 vibrations in one second.

QUESTIONS AND EXERCISES

1. Give from your own experience examples of gradual change in the quality, intensity, extensity and duration of the following sensations :—

- | | |
|------------------|---------------|
| (i) Brightness. | (vii) Smell. |
| (ii) Colour. | (viii) Taste. |
| (iii) Tone. | (ix) Hunger. |
| (iv) Pressure. | (x) Thirst. |
| (v) Temperature. | (xi) Strain. |
| (vi) Pain. | |

9. Examine the corresponding stimuli as they change gradually and say whether the law discussed in this chapter holds in each case.



CHAPTER XIII

AFFECTION

Experiment 37.

Instructions :—Taste a morsel of most ordinary bread when you are fearfully hungry, and carefully observe the state of your mind. Taste a morsel of the same bread when you have overloaded your stomach. Repeat Experiment 28,¹ and scratch gently that part of your body where you are having the sensation of itching. Observe the state of your mind. Go on scratching after the itch has subsided and you no longer feel like it. Compare this state of your mind with the previous one. Sit near a blazing fire when you are feeling cold. Sit near *the same* fire when you are feeling hot. Compare the two experiences. Take a cold bath early in the morning, when you do not like to get out of your bed. Examine the feeling. Then take plenty of physical exercise and when you are perspiring jump into cold water. Compare the state of your mind with the previous one.

The outstanding difference between the two tastes, the two states of pain, the two feelings

1. Page 37.

of heat, and the two experiences of the bath is called **Affection**. The first taste of bread, the first sensation of itch, the first feeling of heat and the first experience of the bath are **Pleasant**. The second taste of bread, the second sensation of itch, the second feeling of heat and the second experience of cold are all **unpleasant**.

Like sensations, pleasantness and unpleasantness, the two affections, are elementary mental processes. They can neither be further analysed nor defined. The only method of explaining pleasantness or unpleasantness is to let the student experience them for himself. But, unlike sensations, their objects do not even inhere in concrete things. They are still more subjective.

In one sense every mental process is subjective, in so far as it is an operation of the mind and not an object existing in the outside world. Perceptions are subjective, feelings are subjective, impulses are subjective, sensations are subjective. But sensations are more subjective than perceptions; and feelings, impulses and affections are more subjective than perceptions and sensations. Perceptions and sensations may be the same but their affective tones may differ. The two perceptions of taste of bread as tastes are exactly the same. But the one is experienced as pleasant and the other as unpleasant. The two sensations of itch as sensations are the same. But the accompanying affections are different.

Again, the perceptions give each percipient the knowledge of the same thing, but under the same conditions the affections may be different in different men. One man likes an object, another dislikes the same object. One man relishes his food, another does not enjoy the same dishes. One man feels happy under certain circumstances, another man feels miserable under the same conditions. The difference is due to something in the mental constitution of the person experiencing and is not due to the nature of things perceived.¹ It is on account of this that affections are said to be more subjective than sensations.

It is important to understand the exact difference between affections and feelings. The former are elementary mental processes, the latter are concrete. Affections are only of *two* kinds—pleasant and unpleasant; while *feelings* are innumerable. Taste of good bread is one feeling, taste of stale bread another; feeling of cold bath is one feeling, feeling of hot bath another; the feeling of cold bath in the morning is one feeling, the feeling of the same bath at noon is another. The feeling experienced at the sight of a book just purchased is different from the feeling of the same book when it gets old, and so on. But each feeling is either pleasant or unpleasant. There may be more of

¹ See Chapter XIV.

pleasantness or unpleasantness in one feeling than in another. But there is no third kind of affection. The manifold differences in feeling are due to differences of sensation and *degree* of affection and not to differences in *kinds* of affection, just as differences in the various perceptions of taste are not due to differences of quality in the sensations of taste as much as to differences in sensations other than those of taste.

Although affections are primarily *subjective* mental processes, there are certain sensations which are always pleasant save in exceptional cases, and others which are always unpleasant except in peculiar circumstances. Sweetness, as for example, is as a rule pleasant, and pain as a rule unpleasant. But under certain circumstances even a sweet object may be unpalatable and a painful sensation slightly pleasant.¹

Feeling may be defined as a concrete mental process in which affection *predominates*, that is, it has sensations as well as conation, but they are inappreciable as compared to the affection by which the mental process is swamped. As we have observed in Chapter IV, every cognitive process is at the same time affective and conative, every conative mental process is cognitive as well as affective, and every affective mental process is simultaneously cognitive and affective.

¹e.g. Scratching the itching spot.

QUESTIONS AND EXERCISES

1. Give from your own experience ten examples each of pleasant and unpleasant affections.
2. Explain clearly what you understand by saying that affections are subjective mental phenomena.
3. Can you detect by an examination and analysis of your own experience any affections other than pleasant and unpleasant? If so, describe them in detail, stating clearly in what they differ from these affections.

CHAPTER XIV

CONATION

Experiment 38.

Instructions :—Ask your friend to bring his finger with a jerk very near your eye,¹ to prick your skin with a pin, or² to tickle your neck with a feather. Enter a stuffy room, take a dip and remain inside the water for some time, stand in the shade when the sun is shining and you are feeling cold. The tendency to wink, to withdraw the limb, to move the neck, the tendency to walk out of the room, to raise the head above water, to move into the sun—are all **conations**.

Conations, like sensations and affections, are elementary mental processes. Impulses³ are the concrete mental processes in which conations predominate. The temptation to wink, to withdraw, to emerge etc. are *different* impulses, but the conation as conation—a simple tendency for movement—is the same in each case. The tendency cannot be experienced alone. It must come as a part of an impulse. In the impulse you can clearly distinguish the elements of sensation, affection and conation. But the latter predominates, while the other two may be quite in-

¹Remove the glasses if you are wearing them.

²Any one of these experiments will suffice.

³See Chapter IV.

appreciable. If we apply the name 'response' to every activity which we make when an object is presented to us, every conation is a stimulus-response tendency. Conation is by far the more important element of mental life, as compared to sensation and affection¹. Sensations supply the content of mind and affections give a clue as to the wholesomeness or otherwise of the mental activities, but conation is the mainspring of all mental life. If there be no sensations mental life would be empty, contentless; if there be no affections mental activity would be unregulated, insipid; but if there be no conation there would be no mental existence at all—there would be no motive for mental life.

We have seen² that we have got innate and acquired tendencies to attend, *i.e.*, to perceive or to know objects which come in our way. These tendencies are conations. In the absence of all conative tendencies there would be no motive for cognition and hence no attention. We perceive and we attend because we have conative tendencies in us to perceive and to attend. We never perceive and never attend to things towards which we have no tendencies of perception or attention although we may be surrounded by them on all sides.

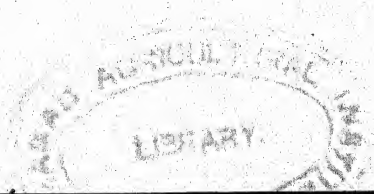
The relation of conation to affection is equally simple, and equally important. Affection, like sensation, follows conation. If a conative tendency is

¹See Primer of New Psychology page 37.

²Chapter 1.

being satisfied, the affective experience is pleasant: if such a tendency is being thwarted the resultant feeling is unpleasant. You enjoy food when you are hungry because the tendency for eating something is being satisfied. You enjoy rest because the tendency for ceasing work is being satisfied. You enjoy basking in the sun because you have a tendency to get external heat, which is being satisfied. On the other hand, you feel unpleasant when you are hungry, because the tendency to take food is being thwarted. You feel unpleasant standing near fire when you are feeling hot, because the tendency to withdraw yourself is being thwarted. You feel unpleasant if you do nothing to satisfy the tendency to get hot, and so on.

Some psychologists go even so far as to say that all pain is unpleasant because there is a universal tendency to keep oneself from injury, and pain is injurious for the organism. Similarly sweet taste is pleasant because sweet objects are generally wholesome food for the body. Hence all sensations of skin which are conducive to the health of the body—*e.g.*, those which we get from sponging, massaging etc.—are pleasant; while all those cutaneous sensations which are harmful for the body are unpleasant, as those given by hard rubbing, pricking, pinching, etc.



QUESTIONS AND EXERCISES

1. Give from your own experience as many examples of conation as you can.
2. Distinguish clearly between conation and impulse.
3. What is the relation of conation to sensation and affection?

CHAPTER XV

KNOWLEDGE OF OBJECTS NOT PRESENT TO SENSE

Experiment 39.

Instructions:—When you are in school, call up to your mind the room which you occupy at home. When you are in the class room, have before your mind the playground with students playing about. When you are sitting on a stool bring before your mind yourself as sleeping in your bed. When you have got a book opened before you¹, call up to your mind the cover of the book. Your knowledge of the room, the playground, of yourself as asleep, and your book as closed, given under these circumstances, are given in the shape of **Ideas**. When you are not perceiving a room, the knowledge of that room is an idea; when you are not perceiving the playground, the knowledge of the playground is an idea; when you are not perceiving yourself as lying, your knowledge of yourself in that posture is an idea; and when you are not perceiving the cover of the book your knowledge of the closed book is an idea, and so on.

You should note that we have used the

¹Only one of these experiments should be performed at a time.

words "when you are not perceiving" and not "when you are not seeing." In order to get the idea of an object, you should neither see it, nor hear it nor smell it, nor touch it, nor taste it, nor get any other sensations *directly from it*. Without actually seeing, hearing, smelling, tasting or touching an object, you should have a knowledge of that object as it is seen, or heard, or smelt, or felt, or tasted or touched. It is enough, in order to ideate an object, if you call up to your mind the name of that object and know full well what that name stands for. In fact most of our ideas are richer—far more symbolic—than ordinary perceptions. Sometimes sight alone, sometimes sound or touch alone, and sometimes the merest sight, sound or touch of the name of an object does service for the whole. It is not at all necessary that the idea of an object be a recollection of all the phases and aspects of the object. Recall of any one phase or aspect may suffice, and may *mean the whole of the object*.

Experiment 40.

Instructions :—Call up to your mind the idea of the room, the playground, the bed or the book, which is not being perceived by you at the moment, and then analyse it in detail. The sensory elements which result are called **Images**.

Your idea of the room may be made up of sights of the floor, the walls, the furniture and other objects placed in the room, or of the hard or soft touches which you feel when you sit there, or of the refreshing or stuffy experiences which you get when you are in that room, or of all these items of knowledge. Similarly your idea of the playground may consist of the sights of grass, students and sporting material, of the sounds of players, or of the sensations which you get from your limbs and internal organs of the body, or of all of these sensory elements. Your ideas of the bed and the book will probably be constituted of the visual imagery corresponding to the sensations of sight which you get when you actually perceive these objects.

If you go to a theatrical performance with a party of friends, and when you come back ask your friends one by one to call up the ideas of the performance and describe them to you, some will give you an account chiefly couched in terms of sight. They will call up visual images to symbolize their ideas—the appearance of the stage, the arrangement of things, the colours of dresses, the sequence of light and shade, in one word, the theatre and the acting *as they saw it*. They belong to what the psychologists call **Visual Imagination Type**.¹ Not that they have no

¹Ordinarily known as Memory Type.



auditory, or tactual, or other images at all, but their images are *chiefly* visual, with a few images of other kinds here and there.

Some will describe their experience in terms of sound. They will call up the images of the music of the orchestra, the recitation of their parts by the actors, the auditory rhythm of the dancing and the tunes of the songs. They will remember and reproduce their experience of the performance *as they heard it*. Along with other forms of imagery—visual, tactual etc.,—auditory images predominate when they ideate things. They are said to belong to the **Auditory Imagination Type**.

Others will explain what they experienced chiefly in terms of what they would feel if they were themselves to act and play. They will call up to their minds the images of words as they are spoken, of movements of limbs and play of feature as they are felt by the person making them, the skilful handling of the instruments as is experienced by the musician through his skin and muscles and joints and tendons. Tactual imagery will predominate in their ideation, other images will be few and far between. They will, in fine, revive their experiences *as they would be given through touch and feel*. They belong to **Tactual Imagination Type**.

There would be still others who would neither call up visual, auditory, tactual, nor other imagery ; but will embody the revived experience in the

form of *words*. Every now and then a visual auditory or tactual image may come up to the surface, but mostly their stock of ideas would be word ideas. They would be described as belonging to **Verbal Imagination Type**. Word ideas are highly symbolic and not many will be found to belong to this type. Perhaps none of your friends may be discovered to be of a verbal type. The lower the stage of mental development less verbal minded the individual. Small children are said to be imaginative because they possess one type or the other of concrete imagery—visual, auditory or tactual—and are not word-minded. Highly cultured and civilized adults are for the most part of their lives word-minded. They call up concrete images only when they need them for some purpose. For the rest they do without them.

But word ideas are not altogether independent of concrete imagery. Every word that is called up to mind must either be seen in the mind's eye, or heard in the mind's ear, or touched by the mental skin. Hence, verbal ideas themselves are of three kinds—visual, auditory and tactual. Some verbal minded people have visual images of the words which they ideate, others have auditory, and others tactual. Strictly speaking there are only three chief Imagination Types—Visual, Auditory and Tactual.

Experiment 41.

Instructions :— Call up the idea of eating; then try to recall the idea of the meal you ate last night. Think of going home; then try to remember how you went home the previous day. Think of a house, then try to recollect the design of the house in which you lived some years ago and which is not occupied by you now. Think of a way; and then try to remember the way to a certain place which you visited some time ago. The thoughts of eating, going home, house, and way are bare ideas; but the thoughts of the last meal you ate, the manner of your going home yesterday, the design of the house you once occupied, and the way by which you once travelled are all **Memories**. A memory idea is an idea with an additional bit of knowledge to the effect that the object of the idea was perceived in the past and a consequent feeling of familiarity with the object. Every memory, therefore, must refer to some past experience or the other. An ordinary idea need not have any such reference. You can have an idea of anything, but when you remember, you must remember an object or an event which you have perceived in the past.

This, however, does not mean that an idea which is not a memory may be entirely independent of past experience. This is far from being true. Every idea when analysed must result

into sensory elements which have been members of past perceptions or reduced therefrom as correlates.¹ No element of a new idea is *sui generis*. It must refer back to some past perception or perceptions.

QUESTIONS AND EXERCISES

1. Give from your own experience five examples of each of the following :—

- (1) Visual idea.
- (2) Auditory idea.
- (3) Tactual idea.
- (4) Word idea.
- (5) Memory idea.

2. Clearly distinguish between Idea, Image and Memory.

3. Try to find out from an examination of your own experience whether any Imagination Types other than those discussed in this chapter are possible.

¹See Chapter XVI.

CHAPTER XVI

NOEGENESIS

Observation 7.

Instructions :—Read through the list of the following pairs of words and examine, as quickly as possible, whether each successive pair is "same" or "opposite", as may be appropriate :—

NICE—PLEASANT, CLEVER—STUPID, RIGHT—CORRECT.

Now observe what you have done in all these cases. While determining whether a pair is same or opposite you have recognized a **Relation**—the relation of **Similarity** or **Dissimilarity**. As the relation is not given, but discovered, the operation is called **Eduction**.

Observation 8.

Instructions :—Read the following questions and the answers given against them and give, as quickly as possible, the number of the correct answer :—

1. Why do we use stoves ? Because

- (1) they look well.
- (2) they keep us warm.
- (3) they are black.

2. Why do we wear clothes ? Because

- (1) they cover nakedness.
- (2) they are in fashion.
- (3) they are well-tailored.

3. Why do we read books ?

- (1) they are beautiful.
- (2) they are cheap.
- (3) they are interesting.

Now observe what you have done in all the three cases. You have again found a relation in each case—the relation between the question and the answer. This relation is one of **Motive**.

Observation 9.

Instructions :—Try to understand the following analogies :—

(1) *3 o'clock* is to *4 o'clock* what *9 o'clock* is to *10 o'clock*.

(2) *To-morrow* is to *Day after to-morrow* what *Day before yesterday* is to *Yesterday*.

(3) *June* is to *July* what *January* is to *February*.

(4) *1926* is to *1927* what *1928* is to *1929*.

If you have understood these analogies, you have in each case educed the relation called **Time**.

Observation 10.

Instructions :—Read through the following pairs of words and find, as quickly as possible, how the objects named in each pair are related :—

Roof-walls, Carpet-Floor, Pillow-Bed, Europe-Africa, Canada-United States, Europe-Asia, Circle-Square, Triangle-Cube.

The relation educed in each case is the relation of **Space**.

Similarity, Motive, Time and Space are not the only relations. There are at least six more relations that are capable of being educed.

The relation between *Work* and *Success*, *Search* and *Attainment*, *Manœuvre* and *Victory*, is of **Objectivity**.

The relation between *Precipice* and *Steepness*, *Knife* and *Sharpness*, *Flower* and *Fragrance*, is of **Attribution**.

The relation between *Weak* and *Infirm*, *Man* and *Human being*, *Jack at eight* and *Jack at eighty*, is of **Identity**.

The relation between X and Y in the expression X Y is of **Conjunction**.

The relation between *Flowing Water* and *Stream*, *Wife* and *Husband* on the one hand and *Couple* on the other, *Blackness* and *Triangularity* on the one hand and this figure on the other, is of **Constitution**.

These ten simple relations can be combined in various ways to give rise to mixed and complex relations. The relations of Conjunction and Similarity, as for example, together make up the relation Quantity, and those of Identity and Dissimilarity go to form that of Change.

The process of eduction of relations can be diagrammatically represented (See Figure 6).

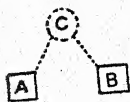


Fig. 6.

A and B represent two objects of mental processes and C the relation between them. As soon as A and B

come into consciousness together or in immediate succession there is a tendency for C to arise in the mind.

Relation-finding is not always so simple as it would perhaps appear from the preceding examples and explanations. Relations can be educed between related and interrelated wholes to any degree of complexity.

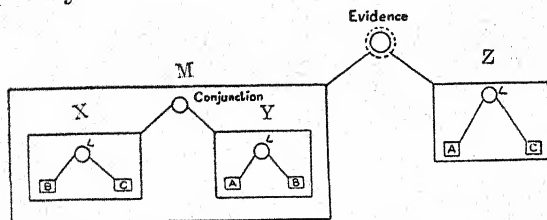


Fig. 7.




In the diagram given above X, Y, and Z are three related wholes, the elements of each being tied together with the relation "is greater than". X and Y together constitute a bigger whole M, the connecting relation in this case being conjunction. A relation of evidence is educed between the two wholes Z and M.




Any two or more things between which there exists a relation are called **Fundaments**, and each Fundament is called the Correlate of the other Fundament or Fundaments, as the case may be. In the example given above B and C, A and B, A and C, Y and X, M and Z are the correlates of each other.

Observation 11.

Instructions :—Complete the following analogies as quickly as you can :—

- (1) Sky is to Blue as Grass is to.....
- (2) Day is to Night as White is to.....
- (3) White is to Black as Good is to.....
- (4) Before is to Behind as Future is to.....
- (5) Prisoner is to Jail as Water is to.....
- (6) Cloth is to Coat as Leather is to.....
- (7) Eye is to Head as Window is to.....
- (8) Book is to Writer as Painting is to.....
- (9) Earth is to Sun as Moon is to.....
- (10) Wheels are to Carriage as Wings are to.....
- (11) Ship is to Water as Camel is to.....
- (12) Music is to Soothing as Noise is to.....

(13)  is to  as  is to.....

(14)  is to  as  is to.....

(15)  is to  as  is to.....

Observe carefully what you have done in all these cases. The moment you understand the first pair of words or figures, you apprehend a relation in each case. The third word or object gives you a new fundament, and as soon as you have completed the analogy you have **educated a correlate**, which bears the same relation to the third object as the second bears to the first.

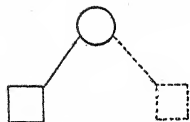


Fig. 8

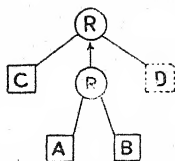


Fig. 9.

There are two important peculiarities about apprehension and eduction of relations and eduction of correlates. First, these operations are not performed according to any laws or principles by referring to which their validity could be tested. The sameness or otherwise of the relations, found in more than one place, and the correctness or incorrectness of the correlates educed are *self evident*. This fact is very important inasmuch as it *rules out the possibility of making mistakes* in the processes of recognizing relations and educing correlates. If any errors of the nature of slips do creep into any of these processes, they are realized by the person making them as soon as they are brought to his notice. This is why it is possible for one man to convince another. While there is always a possibility of our reproductions¹ being wrong, eductions never mislead us if we are careful.

Secondly, eduction is the only kind of mental activity which enables us to know things which we have not directly perceived. In observation No. 11, you have perhaps produced some entirely new items

¹Cf. page 64.

of knowledge (See Fig. 9). The new knowledge is

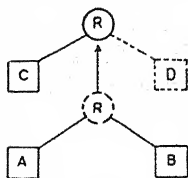


Fig. 10.

in a sense implied in the relation and the correlate with which we start, but it is not given therein. It is educed. It is a new conclusion. It is not contained in any of the items given but is the result of all those coming together in the mind.

By virtue of these two characteristics, self-evidence and generation, the processes of Apprehension of Relations, Eduction of Relations and Eduction of Correlates are known as **Noegenetic**.

Observation 12.

Instructions :—Think of mountain, think of being made of, and think of gold. Think of horse, think of having, and think of wings. Think of man, think of possessing, and think of four arms. The ideas of Golden Mountain, Winged Horse, and Man with Four Arms, which will occur to you, are **Creative Ideas**. 'Being made up of', 'having', and 'possessing' are complex relations. Mountain and gold, horse and wings, and man and four arms are related, not in the way in which they are ordinarily

perceived, but in a novel manner. Hence their originality.

Observation 13.

Instructions :—Think of a sound lower than the lowest sound that you have ever heard and of a light brighter than the brightest of light that you have ever seen. The sound not heard before and the light not seen before, which are imagined by you at this time, are **Creative Images**.

They are images in so far as they are simple, unanalysable cognitive mental processes and they are creative because they have never been experienced by you as parts of perceptions.

QUESTIONS AND EXERCISES

I. Give from your own experience an example of each of the following :—

- (1) Similarity.
- (2) Dissimilarity.
- (3) Evidence.
- (4) Time.
- (5) Space.
- (6) Objectivity.
- (7) Attribution.
- (8) Identity.
- (9) Conjunction.
- (10) Constitution.
- (11) Relation-Finding.
- (12) Correlate-Finding.

2. Explain clearly what you understand by Noegenesis.

3. Give from your own experience or otherwise five examples of each of the following :—

- (1) Creative Idea.
- (2) Creative Image.

CHAPTER XVII

PRIMITIVE TYPES OF MENTAL ACTIVITY

INSTINCT AND EMOTION

If you go with a huge stick near a puny little dog¹ and, with the stick raised by your hand, run after the dog as if you want to strike him, and observe the dog carefully as he runs away, you will note the following points:—

- (1) The dog might not perceive any other object before him ; but he will perceive you with the raised stick, as his enemy, as soon as you are sighted by him.
- (2) A spontaneous tendency to cry and to run away with his tail between his legs will be aroused in the animal.
- (3) The dog will not show any signs of deliberation as to what he should do under the circumstances, but will go on crying and running away in the same posture so long as you are pursuing him. He is so overpowered by the peculiar state of his mind.

¹See foot-note page 82, and pages 112—114 for the methods employed in Psychology.

- (4) At the same time, the animal will not throw himself entirely at your mercy, but will be constantly finding this or that successful or unsuccessful means of escape.

The tendency which is aroused in the dog under these circumstances is called the **Instinct of Fear**, and the state of mind which supervenes is the **Emotion of Fear**.

If you take a huge dog when he is extremely hungry, place meat before him and, as he begins to eat, bring a strong stranger dog and let him try to partake of the food, you will notice (1) that the dog immediately perceives the rival animal, (2) that the tendency of trying to injure the rival animal is aroused in your dog, (3) that the whole body of the dog is in a state of commotion. He bares his teeth, growls ferociously, hairs on his body stand erect, and he tries to bite the enemy every now and then; he throws the whole of his body energy in the business and is overpowered by the mental perturbation. (4) He tries various means of injuring the stranger dog.

The tendency which is aroused in your dog by the presence of the strong stranger dog at the time of his satisfying intense hunger is the **Instinct of Pugnacity, or Anger**, and the perturbed state of the dog's mind which results is the **Emotion of Anger**.

If you take small children to the beach

where there are plenty of shells, or to a place which is strewn with fruit or flowers, pebbles or other strange articles, you will notice that :

(1) the children perceive the abundance of the strange objects immediately,

(2) the tendency of gathering those objects is spontaneously aroused in them,

(3) they busy themselves body and soul in the task of collecting the articles,

(4) they employ various means for doing so, they go this side and that, filling their pockets, hats, laps and what not.

The tendency which is thus aroused in the children is the **Instinct of Acquisitiveness**, and the state of mind in which they find themselves is the **Emotion of Acquisition**.

Experiment 42.

Instructions :—Bring a strange looking harmless instrument with many parts before a small child.

He will at once be attracted by it, will have a tendency to turn it this way and that, and will soon be occupied in trying to explore the strange article in numerous ways.

The tendency which is aroused in the child when he is face to face with a strange object is the **Instinct of Curiosity**, and the state of mind in which he is thrown consequently is the emotion of **Wonder**.

Teach a child who is not shy a feat of skill or let him learn a story or a piece of poetry. Send for him in a party of friends, preferably children with whom the child is more or less familiar, and praise the child vehemently. Then let him perform his feat, or repeat his story or his poetry, as the case may be, and watch the behaviour carefully. A tendency is aroused in the child of showing him off to those who are unable to do what he can do, and he identifies himself with the performance, trying to impress the audience as best as he can. The tendency which is aroused in the child is the **Instinct of Self-Display**, and the state of mind in which the child is at the time of giving the performance is the **Emotion of Elation**.

If you go in a society of well-dressed fashionable rich men with shabby dress on and analyse the state of your mind, you will feel the presence of a tendency to hide yourself or to slip away quietly, you will feel uneasy and fidgety so long as you remain there and will try to conceal your shabbiness or to give explanations for it in various ways. The tendency which is aroused in you under these circumstances is the **Instinct of Self-Abasement** and the state of your mind consequent upon the arousal of this instinct is the **Emotion of Self-Subjection**.

Let a male and a female pigeon become mates by keeping them together in the same hole. Then if you bring them out in fine weather, when they

are well fed and happy, and watch their behaviour, the male bird will evince a spontaneous tendency, which will make him dance and strut and play before his mate—to woo her, in one word. The feeling which would be excited in the male bird when he finds himself in the presence of the mate in the pairing season is the **Instinct of Sex** and the state of his mind at that time is **Sexual Emotion**.

If you go near the young ones of a bitch which has pupped recently, or a she-cat which has given birth to kittens, when the mother is not near them but is seeing them from a distance, you will notice that the mother will at once run up to her young ones and will try to hide them in her limbs. The tendency of protecting the young, which is thus aroused in the mother, is the **Parental Instinct** and the state of mind when the tendency is at work is called **Tender Emotion**.

Fear, Anger, Acquisitiveness, Curiosity, Self-Display, Self-Abasement, Instinct of Sex and Parental Instinct are the principal Human¹ Instincts of a specific nature. Each one of these tendencies determines an end to which certain general tendencies attach themselves. Each instinct

¹ Experiments are performed on animals and small children in the first place because, being primitive types of mental activity, these are not found in grown up civilized men in abundance, and secondly because adults cannot be brought under experimental control in these matters.

is a specific tendency for perception, for feeling and for action. Every one of these tendencies has such a relation with a certain specific kind of objects that whenever a man comes into contact with those objects, he at once perceives them, feels towards them in a certain way and is inclined to act upon them in some manner.

We have seen that the number of feelings is legion¹. The emotion which takes shape when any instinct is aroused is one of the thousand and one different feelings. But the characteristic feature of an instinctive feeling is that it is extremely intense. Perhaps the seven emotions mentioned above are the seven types of the most intense feeling that man is capable of experiencing. Feelings which are not connected with instinctive conation are pale and insipid, as compared to emotions—the feelings connected with instincts. The one cause of the intensity of affection in the cases of instinctive mental activity is the commotion which spreads over the entire organism and lets loose a powerful stream of mental energy.

The presence of object or objects which gives rise to the emotion is ordinarily spoken of as the situation for the emotion. Every specific emotion has its own specific situation. The situation of fear, as for example, is the perception of danger, that of anger the perception of an offensive enemy, and that of

1 See Chapter III.

acquisitiveness the perception of a *lot of things* not in your possession.

Go to a mass meeting held to promote the cause of a movement which you hope to be of personal benefit to you. Listen to the speeches and try to enter the spirit of the lecturers. Very soon you will experience the uprise of a tendency in you to understand things as the leaders of the time understand them, to think as they think, to feel as they feel and to act as they exhort you to act. This will not be your feeling only but every member of the populace present there will have the same feeling and will adopt the same point of view for the time being. This tendency is the **Herd Instinct** and the consequent emotion which the audience is experiencing is the **Social Emotion**.

If you collect a number of toys, show them to a party of small children, then demonstrate the working of the toys to the children and let them be busy with those toys, you will notice that you have infused fresh life into the children; each one of them will have a tendency to do something or the other with the toys, each child will be found engrossed in the activity and adopting his own methods of handling them.

The tendency which you have aroused in your child-friends is **Play Instinct** and the emotion which they are all experiencing while at play is the **Sportive Emotion**.

Herd Instinct and Play Instinct are the two chief general tendencies of man. The first of these is at the

root of all Sympathy, Imitation and Suggestibility. The second keeps man alive by making him forget the seriousness of life for the time being. The fundamental characteristic which distinguishes playful activity from all the other human activities is "that in play the value and significance of the activity is found in the activity itself." Play is its own end. We play the game for the sake of the game and not with a view to achieve any ulterior motive. The activity whose object is to attain a certain end other than itself, to produce some other result, is not play but **Work**.

The Herd Instinct and the Play Instinct do not work for achieving any particular end. If the leader becomes afraid and takes to flight the whole populace is inspired with fear and wants to run. If the leader gets angry and is inclined to kill, the entire following is infused by anger and is bent on killing. And similarly with every other specific tendency. The general tendency attaches itself to any of these. Likewise in play. You may play a game of fear or one of anger or one of acquisitiveness or curiosity and so on. As has been mentioned above, play does not aim at achieving any definite end.

At the lower stage of mental development life is a series of emotional excitements interspersed by periods of sleep and mental inactivity. Take any example of the mental activity of animals, or small children, and you will find that it is some instinct or the other which is at work and the state of the mind

is emotional. The small child or the animal must either be [playing a game of, or imitating, some instinctive activity or the other. It must either be angry in play or seriously, or afraid in play or seriously, or acquiring in play or seriously, and so on.

But the case with the adult human being is different. For the most part of his life he is neither playing, nor is himself the play of emotions. It is only at times that he takes recourse to the one, or falls a prey to the other. Whenever a civilized adult lapses into instinctive mental activity he goes back to the primitive type of action. Whenever you are fearfully angry and forget yourself in the heat of excitement you are *acting primitively*. Whenever you are mortally afraid and tremble, or run away, without calmly deliberating over the situation and chalking out a plan of action, your behaviour is typically primitive, and so on with all the instincts.

QUESTIONS AND EXERCISES

1. Give from your personal experience an example of each of the following :

(1) Fear, (2) Anger, (3) Curiosity, (4) Acquisitiveness, (5) Self-Display, (6) Self-Abasement, (7) Social Emotion, (8) Play.

(2) Distinguish clearly between specific and general tendencies to human action.

(3) Find out by an examination of your own experience all the instincts, general or specific, of which no mention is made in this chapter.

CHAPTER XVIII

ASSOCIATION, CONSCIOUS AND UNCONSCIOUS

If you go twice or thrice with a stick behind the same puny dog, you will notice that the situation for the emotion of fear has undergone a change in the mind of the dog. He does not wait to see the stick rise in your hand but takes to his legs as soon as he sees you or hears your voice. In psychological language you are said to be **Associated** with the object of fear in the dog's mind. Consequently *you* serve as the stimulus for the response ordinarily made to another stimulus.¹

A connection like this, of one object of mental activity with another, is ordinarily known as **Association of Ideas**. Association of ideas plays a very important part in mental life. Most of our cognitions are given to us, and our feelings and conations excited in us, as if *by proxy*. The law of associations is that any two or more mental processes which run their course in the mind simultaneously or in immediate succession tend to be so connected that if any one of them occurs in future the other or others are also inclined to come up. If you always see a man with a

¹Such a response is in Behaviouristic Psychology known as Conditioned Response.

cane in his hand, whenever you think of the man you are inclined to think of the cane. If you always go out when you put on your hat, whenever you wear this head-dress you will feel like going out, and whenever the members of your family see you wearing the hat, they will think of your going out.

If a particular idea is aroused by way of association, obviously it brings its feelings and conations along with it though, may be, in a milder form. Hence every instinct and every emotion can be aroused by the ideas of those situations which ordinarily arouse them. You will feel as much fear if you think that there is a wild beast within a few yards of you as you would do if you see or hear the beast actually. Some people get angry at the very thought of persons who have offended them, and are afraid at the very thought of their enemies. There is such an ignorance of this fact among men that very often emotions aroused by thoughts, hidden in our breast, are ascribed to false causes.

In many cases we can trace the true cause by rummaging our stock of associations with the present object. But many a time we entirely fail to get at the right association. In this elementary text-book we cannot afford space to go into the causes of these associations. But this much every beginner in Psychology knows that these associations do not altogether give up their abode in the mind but

persist incognito and give effect to the feelings and conations attendant on them. The man does actually perceive a certain situation though he thinks that he does not perceive it. Knowledge of this kind is called **Unconscious** or **Subconscious** knowledge. At any time we know many more things unconsciously than we do consciously and our actions are determined by the conscious as well as by the unconscious items of our cognitive life.

We get up exactly at 5 o'clock without consciously ascertaining that it is 5 o'clock. At the proper time we begin doing the thing in which we are keenly interested, without knowing exactly what of the clock it is. We remove the fly from our body or scratch the itching part, when we are busy doing something very important, without having the least consciousness of any of these things. A thousand and one examples may be given of activities which are prompted by unconscious perceptions and ideas of objects and situations.

Not only does the unconscious determine action. It determines most of our thoughts and feelings also. A certain idea comes up to our mind all at once, because it is associated with some unconscious idea which has crept into the subconscious at that moment; and we cannot account for the appearance of the thought at all. The slips of our tongue and our pen, our dreams, our fancies, our

superstitions and idiosyncracies can all be accounted for by their associations with unconscious mental activities. Again, sometimes we feel extraordinarily happy, at others extremely gloomy and morose. Perceptions of certain things give us immense pleasure, others make us unhappy and we simply cannot account for all this. The cause in ninety nine cases out of a hundred is some unconscious mental activity or the other associated with the perceptions of the moment and colouring them with its own feeling tone.

Sometimes certain systems of unconscious mental processes become so predominant and overpowering that they contract associations with nearly all the objects by which we are surrounded and consequently shed their unpleasant effect every other moment on our mental life and make us feel unhappy and wretched. This may even take the form of a disease. So many diseases are nowadays supposed to be caused by the strength gathered by certain unpleasant cognitions which are always lurking in the subconscious, ready to reflect their painful effect on our conscious life. They become a part and parcel of our mental constitution. In fine, the working of association is so complex and so subtle that many a mystery in our mental life would be cleared if we understood the working of this powerful mental machinery, particularly in its unconscious phase, i.e., the associations of the unconscious processes with the conscious processes, and among themselves.

QUESTIONS AND EXERCISES

1. Give many examples from your personal experience of each of the following :—

- (i) Association of one idea with another.
 - (ii) Feelings caused by conscious associated ideas.
 - (iii) Feelings caused by unconscious associated ideas.
 - (iv) Actions prompted by conscious associated ideas.
 - (v) Actions prompted by unconscious associated ideas.
 - (vi) Ideas called up by unconscious associated ideas.
2. Explain clearly what you understand by an unconscious mental activity.

3. Are instincts conscious or unconscious ?

CHAPTER XIX

ADVANCED TYPES OF MENTAL ACTIVITY

The fundamental difference between lower and higher mental activity—primitive and advanced types of mental life,—consists in the different kinds of attention¹ which we give to the objects of our knowledge and the complexity of the relations we apprehend. Animals and small children can attend but passively and cognize only the simplest of relations, while human adults can entertain perceptions and ideas by way of active attention and make use of highly complex relations. In instinctive fear we attend to the object of fear passively. In instinctive anger our attention is passively directed to the offending enemy. But if we, grown up men, like we can attend to objects or ideas actively. With an effort of mind we can arrest the fugitive process of thought and elaborate and enrich it by calling up the most appropriate associates and educing the most complex relationships.

So, we can have active perception, active ideation, active imagination, active memory and active association—the cognitive mental processes which are all preceded by a state of active attention. A feeble

¹See Chapter I.

sound which cannot be heard by way of passive attention can be listened to, and thus heard and understood. We can have an idea of the most difficult thing which is described and explained to us if we give enough of active attention to it. We can imagine the most picturesque scenery and the most extraordinary spectacle by means of active attention. We can remember a name, or a fact, by active attention which passive attention fails to remind us of; and we can call up the most deep-seated association and the most complicated relations only in the state of active attention, which would perhaps never come up if we depended on passive attention alone.

As knowledge advances we feel the need of, and get ample opportunity to exercise, active attention. We needs must make fine distinctions among things which we cannot do by the way of passive attention. Every tradesman, every artist, every diplomat needs active attention. We must organize our knowledge into compact systems. Scientists have to make use of active attention in order that they may succeed in doing this. Above all, the philosophers and the leaders of thought need to exercise active attention otherwise they would give us no new theory, no new line of thought.

All forms of thought proper are given by way of active attention. Strictly speaking, thought should be defined as the emerging of an idea as a result of a

confused mass of knowledge being put to the test of active attention.

Experiment 43.

Instructions :—Read the story given on page 126 carefully. Attend to it item by item, in the state of active attention, and try to arrive at a conclusion regarding the character of the hero. Then give the grounds of your belief in the conclusion at which you have arrived. The proposition at which you have arrived as a result of active attention is called **Judgment** and the act of passing from the grounds to the concluding proposition **Reasoning**.

Suppose you have arrived at the same conclusion—say, “is obedient”—regarding several heroes of stories: Casabianca was obedient, Rama was obedient, a scout is obedient, etc. Then you will be endowed with a general idea—of being obedient in this case. Such a general idea—obedience, as for example, is a **Concept**.

Concepts, judgments, and reasonings are said to be the three forms of thought. They appear only in the state of *active attention*. They distinguish man from animal and adult from child. Primitive forms of mental activity do not—better cannot—avail of them. All advanced mental activity has them as its core and essence.

At the primitive stage of development we fear, not because we ought to fear; but at the higher levels of development we fear because we have reason to

believe that we should fear. Similarly primitive anger is natural; but sublimated anger is anger against a thing which, we have reasons to believe, is injurious for the world—is evil.

Again, primitive fear and primitive anger are aroused immediately—there and then—at the perception of the situation. But higher fear and higher anger are the result of a long series of reasonings—cogitation. Sometimes the deliberations of the generations and centuries which have gone before us are made use of by us in order to arrive at a certain conclusion as to the appropriateness of an object for this or that emotional excitement.

Thinkers after thinkers, as for example, have come to the conclusion that God is mighty, that he can do things which no human power can do. The moment we are convinced of this statement there arises in us the FEAR OF GOD. If God is omnipotent, we consciously or unconsciously conclude that he can punish us, injure us. This idea is the situation for the fear tendency to be aroused. Hence the fear of God. In a being who has not imbibed the traditions of the past ages, or has not given a moment's thought to this subject, or else is not in a position to think and argue, fear of God is not possible. He can only fear a thing which he can perceive and from which, he thinks, it is possible for him to receive physical injury.

All instinctive tendencies, when and in so far as

they have—by virtue of active attention and cogitation—attached themselves to *ideal* situations, are called **Sentiments**. The more remote and more ideal the situation the higher is the sentiment. Just as every activity at the primitive level is motivated by this instinct or that, *all activities at the advanced levels* of mental development are prompted by this sentiment or that. It is only now and then that the civilized human adult forgets his status and resorts to a primitive mode of mental activity. It is then that he gets beside himself and gives himself up to primitive anger, or primitive fear, or another primitive impulse.

Sentiments do not reside ready-made in the organism as instincts do. They are formed gradually in the life of the individual. Hence no sentiments are common to the species as all instincts are. Each man's sentiments are distinctly his own—acquired by him in his own way. Even human instincts are not all so specific as instincts in animals. Sentiments, in particular, are far from being stereotyped. Each man's sentiment expresses itself in its own form. Fear of God, as for example, takes a different shape in each man. So does **RIGHTEOUS INDIGNATION**, and so on.

Although, like instincts, sentiments are conative tendencies, when they are at work they do not shake the organism as emotions do. An instinct at work is emotion—a commotion of the entire organism; a sentiment at work is a sentiment—and nothing

more.¹ But sentiment being a conative tendency, the satisfaction of a sentiment naturally yields pleasure and an obstruction in its way creates an unpleasant situation.

Corresponding to every lowest instinct there is a highest type of sentiment.

FEAR sublimated yields FEAR of GOD or EVIL.

ANGER sublimated yields RIGHTEOUS INDIGNATION against evil.

ACQUISTIVENESS sublimated yields ACQUIREMENT of MERIT or VIRTUE.

CURIOSITY sublimated yields SEARCH for TRUTH.

SELF-DISPLAY sublimated yields LOVE of GREATNESS.

SELF-ABASEMENT sublimated yields MEEKNESS (RESPECT for GREATNESS).

SEX INSTINCT sublimated yields UNIVERSAL LOVE.

PARENTAL INSTINCT sublimated yields MERCY ON THE WEAK AND THE HELPLESS.

HERD INSTINCT sublimated yields ALTRUISM.

PLAY INSTINCT sublimated yields AESTHETIC TASTE.

Fear of God, Righteous Indignation, Acquirement of Merit, Search for Truth, Love of Greatness, Meekness, Universal Love, Mercy, Altruism, Aesthetic Taste are the very highest types of sentiment. Only a few among us develop these sublime conative

¹ Sentiments at work are called HIGHER EMOTIONS by some Psychologists.

dispositions. But there are innumerable varieties of comparatively lower sentiments which are the guiding principles of many a man. Fear of democracy, fear of law, fear of disease; enmity of socialism, of taxation, of vivisection; acquirement of skill; love of research; fashion; love of reputation; respect of the old, of the learned, of the pious, of the great; communalism, provincialism, patriotism, sectarianism; love of teaching, of helping the needy, of charity; love of the other sex, of delicate art, of creative innovations; love of music, dancing, painting are a few examples of sentiments.

QUESTIONS AND EXERCISES

1. Give from your personal experience as many examples of sentiment as you can.
2. Clearly distinguish between Instinct and Sentiment.
3. Give from your own experience five examples of each of the following :—
 - (1) Concept.
 - (2) Judgment.
 - (3) Reasoning.
4. What part does Noogenesis play in the formation of sentiments ?

CHAPTER XX

PRIMITIVE CHARACTER

In the strict sense of the term, children and animals cannot be said to possess character.¹ Real Character is possible only at the higher levels of mental development, not at the primitive level. But the various instincts begin to get into relationship with each other very early in mental development and some instincts soon assert themselves at the expense of others—thus disturbing the equilibrium of primitive conative tendencies. The general law of solidification of instincts is that the more an instinct is exercised the stronger it gets. If any particular instinct gets ample opportunity to function in a primitive life, it becomes powerful and predominant and colours the entire mental constitution of the individual. In the absence of another term we shall call the mental constitution of a child by the name **Primitive Character**.

Some children are cowards, others brave; some are miserly, others profligate. Some are furious, others meek and affectionate; some are shy, others obtrusive; some inquisitive, others dull. Fear predominates in the furious and self-abasement in the shy,

¹See Chapter XXI.

dull and the meek. Acquisitiveness swamps the character of the miserly, curiosity of the inquisitive, and tender emotion of the affectionate.

To some extent the predominance of certain instincts over others is hereditary. In some children certain instincts are prominent from the very beginning, in others some other instincts are prominent. But in many cases some instincts get hold of the child at a very early age because they are exercised oftener than others. They get food to thrive upon, while others are stunted and dwarfed. This is partly due to the situations for certain instincts being more abundant than for others and partly to the sympathetic excitement of some instincts because the elder members of the family or the teachers and governesses are prone to them.

This fact is very important from the point of view of the educator. The character of the parents and the teachers is invariably reflected in the minds of their children and pupils. It determines their character subtly and imperceptibly. The first care that we should therefore take in the interest of the young is that *we* should not get into temper in their presence. We should not yield to abject fear, furious anger, or brutal tyranny when children are about.

The second precaution that we must take if we want our young friends to grow harmoniously is not to allow *them* to give vent to their emotions abundantly. So far as possible we should not per-

mit situations for extreme fear or anger or self-assertion to arise. True education consists in controlling the environment of the child and not in curbing the enthusiasm of the growing individual. If the surroundings are brought into proper control, true discipline is automatically infused in the child. Trying to check the instinctive tendencies of the child, on the other hand, in the presence of the exciting situation is like attempting to stem the tide of a stream rushing down-hill.

Before active attention begins its work formation of character consists in a harmonious functioning of the various instinctive tendencies. If each instinct is being developed as it ought to be, the way is being paved for the formation of real character. If, on the other hand, some instincts are being pampered at the expense of others the child becomes cowardly, peevish, miserly, hypercritical, vain, shy, sensual, credulous, or irresponsible.

It is also necessary to ascertain by scientific methods, pretty early in life, whether any particular instinct is in excess or deficient in the individual child. If the latter, special attention should be paid to its growth and development; if the former, the particular instinct should be kept, as far as possible, in-operative.



QUESTIONS AND EXERCISES

(1) Give from your personal experience examples of children whose character is inharmonious. State what you have observed to warrant you in your conclusions.

(2) What precautions would you take if you were a teacher or a parent ?

CHAPTER XXI

REAL CHARACTER

Real Character consists in the formation of sentiments and their organization into a compact system. The man who, even after adolescence, is the play of instincts has no character. The higher and more sublimated¹ the sentiments which make up a grown up man's mental constitution, the higher is his character; and lower and less sublimated the sentiments, the lower the character.

The degree of sublimation of an instinct is judged from the nature of the situation which excites it. If the particular situation is the result of ignorance or narrow mindedness¹, if many things are not known at all or lost sight of at the time of perceiving the situation, the sentiment is inferior, immoral. If, on the other hand, the situation is well thought out, based on wide experience and vast knowledge¹, the sentiment is superior and morally good.

Take the case of acquisitiveness. If while intent on acquiring things, an individual does not know, or forgets, that there are other men also who should acquire; or if he is ignorant, or oblivious, of the fact

¹See next paragraph.

that there are better things which can be acquired and goes on acquiring himself alone, or the worst of things that he can lay hands on, the sentiment of acquisitiveness that he has formed is surely mean. It will clash with the formation and exercise of healthy sentiments in him and will disfigure his character. He will become selfish.

Take another example—fear. Everyman fears. But by nature man fears the immediate source of physical injury or material loss. A man with a sentiment of fear may therefore be afraid *only* of things like cholera germs and earthquakes. But a sentiment like that would be a very base sentiment indeed. The man with the higher sentiments belonging to fear will avoid earthly dangers no doubt, but will have as his principal objects of fear evils which threaten more essential parts of his nature. He may fear meanness itself; he may be afraid of moral death rather than of physical annihilation. A danger fearing man is a coward.

Similar is the case with anger. Anger is aroused instinctively if another being obstructs the exercise of a strong conative tendency in us. Now, there are higher and lower conative tendencies, as you have seen. The man whose sentiment of anger centres round the baser conative dispositions is base in character. He gets angry if some body snatches his bread, or steals his property, or stands in the way of his miserliness. The man with the higher anger sentiments is he

who gets offended if some body restricts him in exercising his sentiment of charity, goodness, or love.

Formation of higher and lower sentiments alone is not enough to make character. In order that character may be built, in the true sense of the word, it is necessary that there should spring up a system of sentiments in which no single sentiment thrives at the expense of others and none is sacrificed for the sake of the other constituents of the mind. Even if the best sentiments are formed but there is no proportion in them, character will be lacking in strength and forcefulness.

The highest type of fear, as for example, will paralyse healthy mental activity if it drowns all the other sentiments. It will not allow the man to exercise anger, curiosity acquisitiveness or any other emotion. So will anger in extreme retard the functioning of other sentiments, however righteous it may be. It is necessary, therefore, that in an ideal character every sentiment should occupy its own place and due care should be bestowed on the development of every variety of sentiment.

Actions which we perform when we are in the grip of an instinct, pure and simple, are **Impulsive** or **Instinctive Actions**. The instinct which leads us to perform an action is called the **Motive** to that action. Actions motivated by instincts are performed quickly at the spur of the moment. Nature herself determines

what action should be performed under which circumstances and the man performing the action is not therefore held responsible for what he does. We very often hear 'Emotional Excitement' being given as the excuse for not being responsible for an action. The situation is perceived and action performed.

But the actions of which the motives are sentiments are of a different kind. As sentiment involves active attention, thought, deliberation, choice, the actions to which it gives rise cannot be treated as impulsive. They are called **Voluntary Actions**. When a certain situation is perceived we may respond to it by acting in a certain way in the state of passive attention, or we may hesitate, bring our past knowledge to bear on the question in the state of active attention, study the pros and cons, and then decide either to act or not to act. The former would be **Involuntary** or **Non-Voluntary** action as it would be more or less *Automatic*; while the latter would be voluntary as the weight of the whole of our personality would be thrown on its side.

Suppose you are ravenously hungry and have no money in your pocket; you go to the confectioner's shop and think of stealing a bun and eating it. Now, if you make up your mind to steal, you would do so because you think that the shop boy is not seeing you and that if you do not steal you will suffer from the pangs of hunger. This action would be motivated by the lower sentiment of Self-preservation. If you decide not to steal on the

ground that you may be caught and then you would be in trouble, your action would be motivated by the sentiment of Fear of Punishment—again a pretty low sentiment. But suppose you refrain from stealing—thinking that even if no body can detect you, God above is omniscient and the action of stealing is bad in the eyes of God. Your action will then be motivated by the religious sentiment—the Fear of God. This is not a base sentiment indeed; but the highest sentiment which could keep you back from stealing is the sentiment of **Self-Respect**. If your character is perfectly well formed, you would say to yourself:—

“Whether any man sees me or not, whether there be any God or not, “I” cannot steal. It is not consistent with my Self-Respect, with what I am, that I should degrade myself by stealing a bun.” The sentiment of Self-Respect¹ is the highest sentiment of self.

Whenever you act after deliberation your action is a Voluntary Action; you have not allowed yourself to be led away by the instinctive motive, you have summoned active attention, you have called up your past knowledge to your help; in one word, you have weighed the various motives, and have then thrown your personal weight on the side of the one, so that the others may not make headway. All this is the essence of voluntary activity, activity of which the motive is supplied, not by a

¹See Primer of New Psychology, pages 150-158.

headstrong instinct, but by a sober sentiment. You are yourself responsible for all the voluntary actions that you perform and are yourself fully aware of this.

Real Character is, therefore, not formed in you by the teacher or the parent but is made by you. No one who does not think for himself, in the state of active attention, is capable of developing Real Character. The teacher and the parent can help you a great deal by keeping your instincts in harmony and thus minimising the difficulty you have ultimately to experience in restraining the instinct against which a decision may have to be given by your sentiment of Self-Respect in later life. But the sentiment of Self-Respect is of your own making. Each man has the Self-Respect of his own. Each one of us realizes himself in his own way. To have developed the highest self-respecting sentiment is to have realized oneself.

But when we say that self-realization is an *individual* achievement we should not be understood to mean that the lives of those with whom we come in contact in the world, or in literature, do not play any part in the formation of our real character. In the development of character one must needs be greatly influenced by examples—whether consciously or unconsciously. What generally happens is this that some one or the other great personage, in real life, in history, or in fiction, appeals to the growing individual and there spontaneously arises in him a strong desire to

emulate him, to do everything that the ideal character does in the way in which he or she does it. With the growth of experience and critical self-consciousness, however, there appear on the scene other personalities, which, though differing from the first, seem to be equally admirable; and the result is that the thoughtful adult is compelled to pick and choose, and to *construct* an ideal of his or her own, corresponding to which there might be nobody in reality or in literature, and which might answer to his or her own primitive character and peculiar environment.

QUESTIONS AND EXERCISES

1. Give from your own experience five examples of voluntary action and state which sentiment is victorious in each case.
2. What do you understand by Real Character? At what stage do you find the process of formation of character in yourself?
3. Distinguish clearly between Voluntary and Involuntary Action.
4. What part does Noegenesis play in Voluntary Action?

CHAPTER XXII

SCOPE AND METHODS OF PSYCHOLOGY

Psychology is generally defined as the **Science of Mind**. But in fact Scientific Psychology has little to do with mind as such. As a science, Psychology deals with the processes and activities like Perception, Idea, Feeling, Thought, Memory, Sensation, Affection, Conation, Impulse, Instinct, Sentiment—the processes and activities which we have studied under the names Mental Processes and Mental Activities. We have so far mentioned each mental process and activity separately and have treated them as if they were entities existing by themselves and independently in a certain thing known as mind. This is far from the truth. Each mental process and each mental activity has its being in inseparable connection with the other mental processes and activities.

Sensations, as for example, cannot exist except in perceptions, images except in ideas, and affections except in feelings, emotions and sentiments. No perception, thought, feeling, emotion or sentiment, in its turn, can be understood in isolation. We perceive, feel and desire instinctively: every thought, emotion, and sentiment is connected with some instinct or the other, as we have seen. Instincts, again, are

not so many independent and isolated forces coming into operation one by one. Each instinct is a tendency of a mind and is in some essential way connected with all the other tendencies of that mind. If the various instincts of a mind work harmoniously, the character of the individual is well balanced. If the equilibrium of the instincts is lost, the individual's character is distorted.

Although the present day Psychology is an Empirical Science, and proceeds by studying the different mental activities as they are experienced one by one; the point of view of Psychology is necessarily *Individualistic*. Every perception, every thought, every emotion, is the perception, thought or emotion of somebody—it is *lived* by me or by you or by another individual. It is a *life activity*. No mental processes are found hanging in the air, or existing by themselves as the things with which other sciences deal are.

Matter, the subject matter of the science of Physics, exists in the outside world independently of the scientist. So do recombination and decomposition of matter, the subject matter of Chemistry, so does the human or animal body, the subject matter of Physiology, so do plants and animals the subject matter of Botany and Zoology, and so on. But mental phenomena, the subject matter for the science of Psychology, do not exist outside the individual, but are *lived* by him. Psychology, therefore, is in essence

biological and is by some regarded as a branch of the science of Biology.

But it is poles apart from the Sciences of Botany, Zoology and Physiology—in its method as well as in its conclusions. Plants, animals and men can be directly observed by any investigator. We can observe our own bodies as well as the bodies of others—from outside as well as by cutting them open. The X rays and M rays give us a direct insight into the entrails of the living body without vivisection. In fact, the physician knows more about the inner working of the patient's body than the patient knows himself.

Conscious processes, on the other hand, are such that they can be known only by the person whose processes they are. The examination of his own mental processes, by the man whose conscious processes they are, is called **Introspection**. Psychology is distinguished from all other sciences in the world by the fact that it is the only science of which the method is *introspective*. All other sciences are, as compared to Psychology, only *inspective*. The mental life lived by you can be introspected by you and you alone.

In many cases where direct introspective knowledge of the life activities of an individual is not possible to attain, we have to depend upon the external manifestations of those activities. In the case of small children, animals, and insane persons we infer the existence of a certain instinct or sentiment, or certain processes, from their bodily behaviour. When in the

presence of a stranger the mother dog runs to the newly born pups and hides them in her limbs, we infer that her actions are motivated by the Parental Instinct. When a small child asks us questions after questions about a strange object, we understand that he is prompted by curiosity and that he is having a perception of the object. When a mad man puts a crown of straws on his head and behaves as if he were a king, we conclude that he has got the idea of being a king and is in the grip of the emotion of Self-Display. These individuals are not capable of introspecting their mental activities and cannot therefore give us a first-hand knowledge of them. We have to depend upon our inferences from their behaviour which, being based on our knowledge of our own external behaviour, are in most cases correct.

The correct definition of Psychology would therefore be that it is the **Science of Mental Life**, as known to the living individual himself through introspection and to himself and others through an observation of external behaviour. The scope of Psychology is consequently described as living individuals' mental processes, their mental dispositions and their behaviour. If this is all that one understands by mind one will not be wrong in defining Psychology as the science of mind.

In the present volume the author has tried to lead the student in the employment of both the methods—Introspection and Observation of Behaviour. In the

first 41 Experiments the method used is Introspection. The student should be careful to observe the general laws of introspection, which Professor E. B. Titchener beautifully sums up in the following couple of sentences:—"Live the part of mental life which you want to observe, freshly, attentively, impartially and comfortably. When it is past observe it."¹

Introspection being itself a mental process the moment it starts its work it replaces the mental process which it wants to observe. Hence the injunction that the mental process should first be allowed to run its course undisturbed and should then be called up in memory and observed. Proper care should be taken not to allow too much of time to elapse before a mental process is introspected. It should be arrested the very moment it is showing its heels.

In the other experiments the method employed is objective observation, because these experiments are performed on small children and animals, who are incapable of introspecting. These experiments could not be performed on human adults, as sentiments are already formed in them and you cannot force, at will, a grown up man to lapse into the primitive stage of mental activity. Nor is it advisable to sacrifice the individual by disturbing his peace of mind in order that you may learn by experiment. But once a man

¹ Primer of Psychology.

does fall into the primitive mode of activity, he can successfully introspect his mental process as soon as it is past.

The science of all the mental activities which can be introspected—that is, which are possible in sane human adults—is called **Normal Adult Human Psychology**, as opposed to which there are **Abnormal, Child, Senile** and **Animal Psychologies**—*i.e.*, the sciences of the peculiarly abnormal, child, senile, and animal mental activities, which can be known only by objective observation.

There is a branch of human Psychology, normal as well as abnormal, child as well as adult, which deserves special mention. It is **Social Psychology**, the science of those mental processes which take shape because man lives and moves in society. There is practically no mental activity on which the effect of the Herd Instinct is not visible. We perceive as others perceive, think as others think, feel as others feel, and wish and desire as others do, more or less. That aspect of mental life which is a result of the social instinct is studied in particular by Social Psychology. Our customs, our traditions, our laws, our rituals, our language, our institutions and our behaviour when we are in a group—are all expressions of the Herd Instinct and constitute a pretty vast subject matter for the science of Social Psychology.

The science of mental processes and activities in general is called **General Psychology**. This manual

is a text-book of normal, adult, human, individual Psychology. Certain tendencies of child life and animal life are studied only with a view to explain adult human life with reference to them.

QUESTIONS AND EXERCISES

1. Define Psychology and distinguish it from Biology.
2. Give the scope of Psychology, clearly distinguishing it from that of Logic.
3. Describe the methods of Psychology.
4. Name and define the various Branches of Psychology.

CHAPTER XXIII

USES OF PSYCHOLOGY

Being inseparably connected with human life, Psychology is regarded by some as the most useful science of to-day. A first book of Practical Psychology would not therefore be complete without some mention of the applications of Psychology to the useful activities of civilized life.

Psychology is being nowadays most successfully applied to the arts of teaching the young and healing the diseased—to the Sciences of Education and Therapeutics. The Sciences of EDUCATIONAL PSYCHOLOGY and PSYCHO-THERAPEUTICS are fast developing. We cannot treat of them here in any great detail, but we shall try to introduce the beginner to these recently developed branches of knowledge as briefly as we can.

The Educational Psychologist starts with the fundamental facts of psychology as his groundwork. As the unit of education is now recognized to be the individual and not the class, the first task before Educational Psychology is to lay down scientific methods of discovering the innate primitive character

of every child. Various Tests are being used to-day to discover which instincts predominate in a certain child, what special capacities of thought or action he or she possesses, and what course the development of mind has followed in the days of infancy. The most popular branch of Educational Psychology of to-day, therefore, is MENTAL TESTING.

The next thing that an Educational Psychologist studies is the general method of mental development, in what environments should a child be thrown so that he may develop certain forms of mental activity and not others. This study gives him a clue to the Methods of Education in general and the particular ways of developing individual children into mentally healthy and robust adults. A knowledge of the general human tendencies¹ and their working is of inestimable help to the Educator, in so far as many desired qualities can be developed in the child by utilizing them. They help cultivation of new interests and refinement of old ones, without letting the task get unpleasant to the child.

A study of the psychological principles of human character is the next requisite for the Educationist, so that he may know how ideals are formed and may lead the young boy or girl accordingly. Barring the congenital idiosyncracies and peculiarities, the teacher can, within certain limits, guide

¹ See pages 78-86.

the character of the pupil in any fashion he chooses, provided he knows his business. He can make of a young boy a timid lad or a daring youth; an enemy of the customs and traditions, or a priest-ridden and superstitious man; a thorough going investigator or an idler; a keeper of money or a spender of wealth, and so on.

Besides all this, a true teacher must know the laws of the behaviour of Class Mind, as education is not generally imparted to single pupils but to classes. He has to understand the advantages and disadvantages of group training and has to regulate his task according to psychological principles, so as to avail of the former and eliminate the latter, as much as possible. The behaviour of the child in a class is fundamentally different from his behaviour when he is alone, or with his teacher, or in the company of his brothers, sisters, parents, or grandparents.

Above all, the Educational Psychologist is to explain the meaning of true *discipline* and ascertain from a strictly psychological point of view what place punishment occupies in the training of the youth and what kind of punishment is suitable for each occasion and each purpose. Much false belief prevails among teachers regarding the meaning of 'Strict Discipline' and the methods of enforcing it. In most Schools the master's cane still rules, as they believe that sparing the rod is spoiling the child.

Psycho-therapeutics has for its foundation the

fact that body and mind are only the two aspects of one and the same thing—the psycho-physical organism. They are not two separate entities which have come together by a freak of nature. The bodily ailments are, therefore, at the same time mental troubles, and mental deformities diseases of the body. It is Abnormal Psychology therefore which is mainly applied to Therapeutics. There are certain maladies, like Insanity, Hysteria and Nervous breakdown, which are more amenable to a psychical treatment than to physiological medication.

All psychological cure is based upon two fundamental psychological factors, *viz.* Suggestibility and Removal of Repression. Many ailments have been cured by the patient suggesting to himself (**Auto-Suggestion**), or the Doctor suggesting to him (**Hetero-Suggestion**), the nature of healthy bodily activity and that he is going to be restored to that. Auto-suggestion and Psychiatry follow those methods and are nowadays practised as regular arts of curing patients.

Another method which is much talked of in certain medical circles is **Psycho-analysis**. Psycho-analysis is based on the assumption that certain strong sentiments are denied exercise altogether—they are for some reason repressed. As a result of repression they become unconscious, but do not lose their strength. So, when the bodily strength is at its wane and these strong repressed sentiments—**Complexes** as they are

called—find an outlet through conscious situations to which they are associated, they imperceptibly assert themselves and make the patient behave in all sorts of fantastic ways which are taken to be physical ailments and explained and located in many unsuccessful ways by the ignorant. The votaries of Psychoanalysis claim that the moment the repressed complex is unearthed, is brought up to the conscious life and begins to function properly, the abnormal behaviour ceases and the patient is cured. The illustrious founder of this School of Therapeutics is Dr. Freud of Vienna and many of his pupils are following his technique in the Mental Hospitals which they have started for this purpose. They have succeeded marvellously in many cases.

Besides Education and Therapeutics, the field of application of Psychology extends to Commerce, Industry, Crime and Employment. The COMMERCIAL PSYCHOLOGIST aims at establishing clear cut principles according to which manufacturers and dealers can push the sale of their commodities by exploiting the instinctive tendencies of the people. They are trying to find out precisely what psychological effect a certain trade mark, patent, advertisement or packing produces on the mind of the public. The work of the tradesman, the middle-man and the Commercial Lawyer and Judge are much facilitated in this way.

INDUSTRIAL PSYCHOLOGY studies the mental capacities of the labourers and the psychologically best

conditions and environments for efficient labour. They test the factory men in small psychological laboratories and ascertain which labourer is best fitted to perform which task. This helps the division of labour immensely and many factory owners have gained a considerable lot by getting their men tested psychologically. Again, the arrangement of seats, the posture and place of the workman, the height of the tables and chairs—and all the surrounding objects—can be brought under psychological investigation and arranged accordingly, much to the benefit of the employer, the employed and the consumer.

CRIMINAL PSYCHOLOGY is a branch of Abnormal Psychology. Certain Instincts and sentiments are developed beyond the limits of safety and the loss of equilibrium sometimes results in crime. Psychology of crime studies the true cause of every criminal habit and tries to remedy it psychologically. We find psychologists attached to courts of law and to nearly all the big jails to-day.

EMPLOYMENT PSYCHOLOGY is, from one point of view, a branch of Industrial Psychology. Psychology can be applied in every trade and calling as it is applied to Industrial Organizations. Vocational Psychology aims at testing each individual scientifically and determining which capacities and dispositions are uppermost in him and which are lacking altogether—thus discovering for which profession the individual is eminently fitted. By hard work and expenditure of enough active attention every man can pick up nearly

every kind of work. If a man is by nature fitted to do a certain kind of work, for him to do that work is to follow the line of least resistance ; and he will attain a mastery of, and will excel in, his calling before long.

To take a single example, American soldiers were psychologically tested in the Great War to determine which volunteer was fit to be a General, which to be a corporal and which a private. Space does not allow us to go into the details of Alpha and Beta tests. But **Army Tests**, as they are called, are very simple psychological devices to judge the general capacity and intelligence of large groups of men in a few minutes. They have succeeded admirably in the hands of experts. " Among all the achievements of psychological examiners, the testing of nearly 2,000,000 recruits for the American Army still remains the most remarkable. In this examination the main object was twofold : to eliminate as rapidly as possible all who had not sufficient intelligence to be safely trusted with a rifle and to discover all who possessed a sufficiently high ability to be immediately selected for training as commissioned or non-commissioned officers. Incidentally, however, the records and the results proved of great service in many other ways."¹

¹Psychological Tests of Educable Capacity.

QUESTIONS

1. Name and describe all the branches of Applied Psychology that you know of.
2. Describe the relation of Psychology to Pedagogy and to Therapeutics.

"OF ENVY"

A man that is busy and inquisitive is commonly envious: for to know much of other men's matters cannot be because all that ado may concern his own estate: therefore it must needs be that he taketh a kind of play-pleasure in looking upon the fortunes of others; neither can he that mindeth but his own business find much matter for envy. For envy is a gadding passion, and walketh the streets, and doth not keep home.

Bacon.

Casabianca.

Casabianca, a small boy, was the son of the captain of a French man-of-war. At the battle of Aboukir, having first secured the safety of his crew, the captain blew up his ship, to prevent it falling into the hands of the English. Casabianca was set by his father on watch. The ship caught fire, and his father was burnt to death. As the flames spread, the boy called to his father, but there was no response. Still the boy stuck to his post and would not move till he received order from his father. The ship blew up and the boy was killed.

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